MICROCODE LISTING:

077-000115-02

PROGRAM:

LP2/TP2 FIRMWARE

USED ON:

100-002127 THRU 100-002132

```
                .TITL   LP201

000000          .DO     0


        1.      DASHER LP2 TP2 FIRMWARE:
                ------------------------

                THIS FIRMWARE IS DESIGNED IN MICRO-NOVA LANGUAGE FOR
                THE USE OF DASHER PRINTER. THE PROGRAM ASSUMES THAT
                IT WILL RESIDE IN 1 1/2 K OF ROM AND WILL HAVE 2K OF
                RAM STARTING AT LOCATION 0 AVAILABLE FOR ITS USE.

        2.      PROGRAMMING AIDS:
                -----------------

                FOLLUWING INFORMATION IS IMPORTANT FOR ANY ONE TO
                UNDERSTAND THE FLOW OF THE FIRMWARE AND TO DEBUG IT.

        2.1     IN'S AND OUT'S
                --------------

                IN ORDER TO SIMPLIFY THE HARDWARE DASHER DOES NOT
                SUPPORT THE I/O FUNCTIONS. ALL THE IMPUTS AND
                OUTPUTS ARE DONE USING LOAD AND STORE INSTRUCTIONS
                WITH ADDRESSES OVER 37770.

        2.1.1   IN FUNCTIONS
                ------------

                THERE ARE EIGHT IN FUNCTIONS (IN0 THRU IN7) AVAIL-
                ABLE TO INPUT INFORMATION FROM THE DASHER HARDWARE.
                THEIR ADDRESSES ARE 37770 THRU 37777. THUS LOADING
                OF AN ACCUMULATOR FROM LOCATION 37770 WILL BE REF-
                FERED TO AS IN0 AND THE ACCUMULATOR WILL GET LOADED
                WITH 16 BITS OF INFORMATION FROM THE DASHER HARDWARE.

        2.1.2   OUT FUNCTIONS
                -------------

                THERE ARE EIGHT OUT FUNCTIONS (OUT0 THRU OUT7) AVAIL-
                ABLE TO OUTPUT INFORMATION TO THE DASHER HARDWARE.
                THESE FUNCTIONS ARE ADDRESSED BY ADDRESSES HIGHER
                THAN 40000 - ADDRESS BITS 2,3, AND 4 ARE USED TO
                SELECT ONE OF THE EIGHT OUT FUNCTIONS AND THE INFOR-
                MATION ON BITS 5 THRU 15 IS TRANSFERED TO THE DEVICE
                THUS STORING OF ANY ACCUMULATOR AT THE ADDRESS OF
                40177 WILL PERFORM AN OUT 0 AND SEND 177 TO THE DASHER.

        2.1.3   LIST OF IN FUNCTIONS
                --------------------

        IN0     USED TO READ DATA FROM CHAR GEN.
                        BDATA 6-15

        IN1     BIT 0   HOME STATUS     EQUAL TO ZERO WHEN BEHIND
                                        HOME
                BIT 10  SELF TEST INT.  EQUAL TO ZERO FOR SELF TEST
                BIT 11  VERT INTERRUPT  EQUAL TO ZERO FOR VERT MOTION
                BIT 12  KEYBOARD INT    EQUAL TO ZERO KEYBOARD DATA
```



```
                BIT 13  TICK INTERRUPT   EQUAL TO ZERO CLOCK TIMEOUT
                BIT 14  PRINT INTERRUPT  EQUAL TO ZERO PRINT POS.

                BIT 15  START CHAR INT   EQUAL TO ZERO FOR START OF CHAR

        IN2     BIT 7   ERROR            EQUAL TO ZERO FOR UART ERROR
                BITS 8-15                DATA FROM UART

        IN3     BIT 0   PAPER FAULT      EQUAL TO ZERO FOR OUT OF FORMS
                BIT 1   ESC DISABLE      EQUAL TO ZERO TO DISABLE
                BITS 8  FORM FEED        EQUAL TO ONE FOR COUNT
                     15 COUNT            OF LINES IN FORM

        IN4     BIT 0   VIEW ENABLE      EQUAL TO ONE VIEW ON
                BIT 1   ON LINE          EQUAL TO ONE FOR ON LINE
                BIT 2   DATA AVAILABLE   EQUAL TO ONE FOR DATA AVAILABLE
                BIT 3   TBE              EQUAL TO ZERO BUSY
                BIT 4   CARRIER DETECT   ZERO FOR CARRIER DETECT
                BIT 5   CLEAR TO SEND    EQUAL TO ONE FOR CLEAR
                BIT 6   1/2 DUPLEX       EQUAL TO ONE FOR 1/2 DUPLEX
                                         AND LOCAL COPY
                BIT 7   NOT USED
                BIT 8   LINE FEED        EQUAL TO ZERO FOR LINE FEED
                BIT 9   FORM FEED        EQUAL TO ZERO FOR FORM FEED
                BIT 10  DATA SET READY   EQUAL TO ZERO FOR READY
                BIT 11  NOT USED
                BIT 12  NOT USED
                BIT 13  NOT USED
                BIT 14  BUSY             EQUAL TO ZERO SOFTWARE BUSY
                BIT 15  SERIAL           EQUAL TO ZERO FOR SERIAL

        IN5     RESET KEYBOARD INT.
                        9-15 KEYBOARD DATA

        IN6     START TIME TASK

        IN7     BIT0    FORM FEED INIT   ONE TO INIT. THE FORM FEED
                BIT1    NOT USED
                BIT2    COMPRESSED       ONE IF THE JUMPER IS IN
                        PRINT JUMPER
                BIT3    NOT USED
                BIT4    ALT JUMPER       ONE IF THE JUMPER IS IN
                BIT5    NOT USED
                BIT6    NOT USED
                BIT7    NOT USED
                BIT8    6/8 LINES PER    6=ZERO
                        INCH             8=ONE
                BIT9    NOT USED
                BIT10   NOT USED
                BIT11   COMPRESSED       ONE TO SELECT COMPRESSED
                        PRINTING MODE
                BIT12   NOT USED
                BIT13   ALT SELECT       ONE TO SELECT ALT MODE
                BIT14   NOT USED
                BIT15   AUTO SKIP        ONE TO ENABLE AUTO SKIP

        2.1.4   LIST OF OUT FUNCTIONS
                ---------------------

        OUT0    RESET POWER UP INIT
```

```
01
02              OUT1    TRANSFER DATA TO HOST
03                              DATA 9-15
04
05              OUT2    BIT 9   ERROR LIGHT     EQUAL TO A ONE TO LIGHT LED
06                      BIT10   RUN LED         EQUAL TO A ONE TO LIGHT LED
07                                              ON CONTROL BOARD WHEN MOTOR
08                                              HAS BEEN TURNED ON
09                      BIT 11  DATA TERMINAL   ONE WHEN THE DEVICE IS READY
10
11                      BIT12   ON LINE         ONE WHEN THE DEVICE IS ON LINE
12                      BIT13   READY LIGHT ON  ONE TO TURN ON THE LIGHT
13
14                      BIT14   REQUEST TO SEND EQUAL TO ONE WHEN NOT BUSY
15                      BIT15   BREAK           ONE TO SEND THE BREAK
16
17              OUT3    BIT12   SELECT ALT      ONE TO SELECT ALT
18                      BIT13   PRINT MASK      ZERO TO MASK OUT
19                      BIT14   PRINT SELECT    0 REG
20                                              1 COMPRESSED
21                      BIT15   BELL
22
23              OUT4    FIRE THE PRINT WIRES
24                      BITS    7-15
25
26              OUT5    MOTION  CONTROL
27                      BIT 10
28                      &       PAPER FEED COMMANDS
29                      BIT 11
30                      HORIZONTAL MOTION COMMANDS:
31                      BIT 12  INC/SLOW SPEED
32                      BIT 13  DIRECTION OF    0 TO MOVE TO THE RIGHT AND
33                              MOTION          1 TO MOVE TO THE LEFT
34                      BIT 14  STOP BIT        0 TO STOP THE HORIZONTAL MOTION
35                      BIT 15  110/180 SPEED
36
37              OUT6    INTERRUPT RESET
38                      BIT10   SELF TEST       ONE TO RESET SELF TEST
39                      BIT11   VER INT         ONE TO RESET VERT INT
40                      BIT12   NOT USED
41                      BIT13   TICK            ONE TO RESET TICK INT
42                      BIT14   PRINT           ONE TO RESET PRINT INT
43                      BIT15   START CHAR       ONE TO RESET START CHAR
44
45              OUT7    ADDRESS FOR CHAR GEN
46                              BITS 6-12       CHAR
47                              BITS 13-15      COUNT FOR POS
48
49              2.2     FIFO
50                      ----
51
52                      THE FIRMWARE HAS A SOFTWARE FIFO TO BE USED AS THE
53                      BUFFER BY THE PRINTER. ALL OF THE RAM LOCATIONS OVER
54                      OCTAL 400 WILL BE USED AS THE BUFFER. LOCATIONS 400
55                      THRU 407 ARE USED BY THE KEYBOARD AND REST OF THE
56                      BUFFER IS USED BY THE PRINTER HOWEVER DOWN LINE
57                      LOADED CHARACTER SETS GO IN LOCATION 2000 TO
58                      3770 THE BUFFERS ARE CHARACTER ORIENTED AND TWO
59                      CHARACTERS ARE SAVED IN EACH LOCATION WITH THE LEFT
60                      BYTE CONTAINING THE FIRST CHARACTER.
```



```
01                      PICTURE OF THE FIFO (RING BUFFER) IS AS FOLLOWS:
02                      MASK:   N-1     ;NUMBER OF BYTES THE FIFO CAN HOLD -1
03                      LI:     0       ;OFFSET FROM BASE IN BYTES OF THE LAST
04                                      ;CHARACTER STORED
05                      LO:     N       ;AFTER INCREMENTING AND MASKING WITH
06                                      ;MASK LO WILL HAVE THE OFFSET FROM LI
07                                      ;IN BYTES
08                                      ;TO THE LAST CHARACTER GOTTEN OUT
09                              BASE*2  ;BYTE POINTER TO THE STARTING OF THE
10                                      ;BUFFER WHERE BASE IS THE STARTING
11                                      ;ADDRESS OF THE BUFFER ITSELF.
12
13              2.2.1   SAVING AND RESTORING FROM THE FIFO
14                      ----------------------------------
15
16                      CHARACTERS FROM THE KEYBOARD ARE RECEIVED ON AN
17                      INTERRUPT BASIS. THEY ARE SAVED IN THE KEYBOARD BUFFER
18                      AND ARE EITHER SENT UP TO THE HOST IF THE DEVICE IS ON
19                      LINE OR ARE PRINTED IF THE DEVICE IS OFF LINE.
20                      CHARACTERS FROM THE HOST CPU ARE ONLY RECEIVED WHEN
21                      THE DEVICE IS ON LINE, IN WHICH CASE THEY ARE SAVED IN
22                      THE PRINTER FIFO. PRINTER STARTS PRINTING THE CHARACTERS
23                      AS SOON AS THEY ARE RECEIVED. WHEN A LINE TERMINATOR
24                      SUCH AS RETURN, LINE FEED OR FORM FEED IS RECEIVED FOUR
25                      BYTES FOLLOWING THE TERMINATOR ARE INITIALIZED TO 0 FOR
26                      THE PRINTER'S LOOK AHEAD FEATURES. FIRST BYTE GETS LOAD-
27                      ED WITH THE NUMBER OF LEADING SPACES IN THE LINE FOLLOW-
28                      ING THE TERMINATOR, SECOND BYTE IS MADE NON-ZERO IF AN
29                      ESCAPE COMMAND IS PRESENT IN THE LINE AND THE THIRD BYTE
30                      IS LOADED WITH THE NUMBER OF CHARACTERS IN THE
31                      LINE. THE FOURTH BYTE HAS NUMBER OF PRINTABLE
32                      CHARACTERS IN THE LINE.
33                      -A BACKSPACE IS SUBSTITUTED BY A RETURN AND X-1 LEADING
34                       SPACES, WHERE X WAS THE TOTAL NUMBER OF CHARACTERS IN
35                       THE LINE BEFORE THE BACKSPACE WAS ISSUED.
36
37              2.3     TABING
38                      ------
39
40                      BOTH VERTICAL AND HORIZONTAL TABS ARE SAVED AS ONE BIT
41                      PER CHARACTER POSITION FOR HORIZONTAL TABS AND LINE FEED
42                      POSITION FOR VERTICAL POSITION. SETTING OF TAB IS
43                      ACHIEVED BY SETTING THE RESPECTIVE BIT.
44
45              2.4     SCANNING LOOP
46                      -------------
47
48                      WHILE IDLING OR AFTER COMPLETING AN OPERATION THE
49                      PROGRAM RETURNS TO A LOOP STARTING AT LABEL "SCAN".
50                      THIS LOOP LOOKS FOR THINGS TO DO, SUCH AS SETTING OF THE
51                      ON LINE FLAG, LOOKING FOR THE COMM. LINES' STATUS, CHA-
52                      RACTERS RECEIVED FROM THE HOST, CHARACTERS TO BE PRINTED,
53                      ESCAPE COMMANDS, ETC. CHARACTERS RECEIVED FROM THE HOST
54                      ARE ONLY READ AND SAVED IF THE PRINTER IS ON LINE AND
55                      THE PRINT BUFFER IS NOT FULL.
56                      IF A KEY WAS HIT, THE PRINTER IS ON LINE AND THE UART IS
57                      FREE THEN THE ASCII CODE OF THE KEY IS SENT TO THE HOST.
58                      IF AT THAT TIME A LOCAL COPY WAS DESIRED THEN
59                      PREPARATION IS MADE TO PRINT THE CHARACTER.
60                      WHEN THE PRINTER BECOMES AVAILABLE THE NEXT CHARACTER TO
```

BE PRINTED IS TAKEN FROM THE FIFO (KEY BOARD BUFFER IF IT IS OFF LINE AND PRINT BUFFER IF IT IS ONLINE). IF THE FIFO IS EMPTY THEN A STOP COMMAND TO THE HORIZONTAL STEP MOTOR IS ISSUED AND THE SCAN LOOP IS REPEATED. IF THERE IS A CHARACTER TO BE PRINTED THEN A COUNTER "PRCNT" IS SET TO THE NUMBER OF TIMES THE PRINT WIRES WILL BE FIRED (7 FOR REGULAR AND 13 FOR ELONGATED).
AFTER PRINTING OF THE FIRST CHARACTER BEGINS THE NEXT CHARACTER IS READ FROM THE FIFO AND CHECKED FOR A ESCAPE COMMAND, WHICH IF PRESENT IS EXECUTED.

IF THE CHARACTER TO BE EXECUTED IS A LINE TERMINATOR THE PROGRAM FLOW JUMPS TO THE LABEL "NXTLN" AND BASED ON THE POSITION OF THE HEAD AND THE LENGTH OF THE NEXT LINE A DECISION REGARDING THE PRINT DIRECTION IS MADE ALONG WITH DECISIONS ABOUT THE OPTIONS WHICH CAN ONLY BE SELECTED ON A LINE BY LINE BASIS SUCH AS COMPRESSED PRINT MODE.

3. USER'S INFORMATION

DASHER IS AN INTELLIGENT PRINTER CAPABLE OF MAKING DECISIONS WHEN NEEDED, SUCH AS THE PRINT DIRECTION OF THE FOLLOWING LINE AFTER COMPLETING A LINE. OTHER FEATURES INCLUDE THE FOLLOWING COMMANDS.

3.1 COMMAND STRING

CNT. 0 DESELECT ALT MODE
CNT. N SELECT ALT MODE

ESCAPE I.E. A CODE OF 33 IS CONSIDERED THE STARTING OF A COMMAND STRING.

ESC 1 SETS HORIZONTAL TAB AT THE PRINT HEAD POSITION.
ESC 2 CLEARS HORIZONTAL TAB AT THE PRINT HEAD POSITION.
ESC 5 SETS VERTICAL TAB AT CURRENT LINE POSITION.
ESC 6 CLEARS VERTICAL TAB AT CURRENT LINE POSITION.
ESC C(LOWER CASE) MASTER RESET
ESC Y 2 BYTES OF BYTE COUNT, 2 BYTES OF STARTING BYTE ADDRESS, DATA, AND 1 BYTE OF NEGATED CHECK SUM IS THE SEQUENCE TO BE FOLLOWED FOR DOWN LINE LOADING INFORMATION IN THE DASHER MEMORY.
ESC B(LOWER CASE) DESELECT UNDER SCORE
ESC A(LOWER CASE) SELECT UNDER SCORE
ESC E(LOWER CASE) CLEARS PLOTTING MODE
ESC D(LOWER CASE) SETS PLOTTING MODE
ESC ? CLEARS COMPRESSED PRINT MODE.
ESC > SETS COMPRESSED PRINT MODE.
ESC = CLEARS ELONGATED PRINT MODE.
ESC < SETS ELONGATED PRINT MODE.
ESC N 2 BYTES OF ADDRESS, SELECTS DOWN LINE LOADED CHARACTER SET STARTING AT THE GIVEN ADDRESS.
ESC Z 2 BYTES OF ADDRESS, STARTS EXECUTING THE DOWN LINE LOADED PROGRAM AT THE DEFINED ADDRESS.
ESE E #1,#2,#3....NULL, SETS HORIZONTAL TABS AT LOCATIONS #N, WHERE #N IS THE HORIZONTAL POSITION OF THE PRINT HEAD.

ESC E NULL, CLEARS ALL OF THE HORIZONTAL TABS
ESC F #1,#2,#3,....NULL, SETS VERTICAL TABS AT LOCATION #N, WHERE #N IS THE VERTICAL POSITION OF THE PRINT HEAD.
ESC F NULL, CLEARS ALL OF THE VERTICAL TABS.
ESC O CLEARS DOWN LINE LOADED CHARACTER SET.
NOTE

NOTE #1,#2,#3 ONLY AN OCTAL VALUE REQUIRED (012) LINE FEED KEY SETS FIRST TAB AT POS ITION 10 FOR FIRST TAB OCTAL (024) SETS SECOND TAB AT POSITION 20 ETC.

3.1.1 RESTRICTIONS TO THE COMMAND STRING

1. COMPRESSED MODE WILL ONLY FUNCTION ON A LINE BY LINE BASIS.
2. COMMANDS RELATED TO VERTICAL AND HORIZONTAL TABS CAN ONLY BE ISSUED AFTER A LINE TERMINATOR.
3. ANY LINE WITH A COMMAND IN IT WILL BE PRINTED FROM LEFT TO RIGHT.
4. ANY LINE WITH ELONGATED PRINTS IN IT WILL BE PRINTED AT THE LOW PRINT RATE
5. MEMORY AVAILABLE FOR DOWN LINE LOAD IS FROM 240 TO 377 AND 2000 TO 3770 IN RAM.
6. DOWN LINE LOADED CHARACTER GENERATOR SHOULD BE STARTING ADDRESS (2000)8 SO AS NOT TO INTERFERE WITH BUFFER.
7. PLOTTING MODE WILL ONLY FUNCTION ON A LINE BY LINE BASIS. THE LINE HAS TO BE TERMINATED TO BE PRINTED.

3.2 POWER FAIL

THE BUFFER WILL BE LOST ON A POWER FAIL AND THE PRINTER WILL GET INITIALIZED TO SWITCH CONFIGURATION ON RESUMPTION OF POWER.

3.3 MACHINE CONFIGURATION

MACHINE CONFIGURATION IS ONLY MONITORED ON AN INITIALIZE OR WHEN THE PRINTER IS OFF LINE.

3.4 UNEXPECTED MOVEMENT OF THE PRINT HEAD

IF THE PRINT HEAD IS MOVED BY HAND OR IT DOES NOT STOP AT THE POSITION IT WAS SUPPOSED TO BECAUSE OF OVERSHOOT THEN THE HEAD WILL REINITIALIZE USING THE HOME FLAG BEFORE PRINTING THE NEXT CHARACTER AT ITS CORRECT PLACE.

3.5 1/2 DUPLEX MODE

THIS MODE WILL CAUSE THE CHARACTERS BEING TRANSMITTED TO THE HOST TO BE ECHOED ON THE PRINTER.

4. PRINTER OPERATION

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
 0007  LP201
01                      PRINTING AT LOW SPEED STARTS AS SOON AS A CHARACTER IS
02                      RECEIVED, AFTER THE FIRST LINE IS PRINTED THE PRINTER
03                      SPEED IS INCREASED TO 180 CPS.
04
05
06              5.      SELF TEST
07                      ---- ----
08                      OPERATION OF SELF TEST MODE
09
10                      1.      MASTER RESET PRINTER
11                      2.      SELECT OFF LINE
12                      3.      SELECT MACHINE CONFIGURATION ON CONTROL
13                              PANEL 6 OR 8 LINES COMPRESSED OR REGULAR
14                              PRINT AUTO SKIP ON/OFF FORM LENGTH THEN
15                              PRESS TOP OF FORM INITIALIZE
16                      4.      TURN ON SELF TEST SWITCH
17                      5.      SELECT ON LINE
18                              PRINTER WILL THEN BE IN SELF TEST MODE
19                      6.      MASTER RESET TO GET OUT OF SELF TEST
20                      7.      IF AN OTHER MODE OF TEST IS DESIRED GO OFF
21                              LINE SELECT MODE GO BACK ON LINE.
22
23
24
25
26                      .ENDC
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
10008  LP201
01       000001         .NOCON  1
02              ;VOL0 FOR PROTOTYPE # 1
03              ;CLEVER PRINTER PROGRAM
04
05       000001 .TXTM    1
06              ;SYMBOL DEFINITIONS
07       000000 MASK     =0
08       000001 LI       =1
09       000002 LO       =2
10       000003 BBUF     =3
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
!0009   LP201
01
02                ;INITIALIZATION PUTS CONSTANTS IN LOCS 1 THROUGH END-INITA.
03
04          000066          .LOC    END-INITA+1
05                ;UNINITIALIZED VARIABLE SPACE IN PAGE 0
06          000066 RETA     =.
07  00066  000001          .BLK    1       ;RETURN ADDRESS MAIN LEVEL SUBROUTINES
08          000067 RETS     =.
09  00067  000001          .BLK    1
10          000070 VRTIN    =.
11  00070  000001          .BLK    1       ;NUMBER OF VERTICAL INTERRUPTS EXPECTED
12          000071 VRTWT    =.
13  00071  000001          .BLK    1       ;THIS FLAG WILL BECOME 0 WHEN A VERTICAL
14                                          ;INTERRUPT IS EXPECTED
15          000072 VRTFL    =.
16  00072  000001          .BLK    1       ;FLAG FOR VERTICAL STEP COMMAND
17          000073 VSLEW    =.
18  00073  000001          .BLK    1       ;NUMBER OF VERTICAL STEPS TO BE TAKEN
19                                          ;BEFORE PRINTING THE NEXT LINE
20          000074 VPOS     =.
21  00074  000001          .BLK    1       ;POSITION OF FORMS IN FULL STEPS
22          000075 VRSTP    =.
23  00075  000001          .BLK    1       ;COUNT OF THE VERTICAL STEPS NEEDED FOR
24                                          ;A LINE FEED
25          000076 DLLA     =.
26  00076  000001          .BLK    1       ;BYTE ADDRESS FOR DOWN-LINE-LOAD
27          000077 DLLB     =.
28  00077  000001          .BLK    1       ;BYTE COUNT, NEGATIVE
29          000100 DLLC     =.
30  00100  000001          .BLK    1       ;CHECK SUM
31          000101 HPOS     =.
32  00101  000001          .BLK    1       ;POSITION OF CARRIAGE
33          000102 HSLEW    =.
34  00102  000001          .BLK    1       ;DIRECTION AND NUMBER OF STEPS
35                                          ;TO BE MOVED BEFORE PRINTING THE
36                                          ;NEXT CHARACTER
37          000103 TEMP1    =.
38  00103  000001          .BLK    1
39          000104 TEMP2    =.
40  00104  000001          .BLK    1       ;TEMPORARY STORAGE LOCATION
41          000070 TEMP3    =VRTIN
42          000105 SVEX     =.
43  00105  000001          .BLK    1
44          000105 TEMP4    =SVEX
45          000106 TEMP5    =.
46  00106  000001          .BLK    1
47          000107 CHCNT    =.
48  00107  000001          .BLK    1       ;COUNT OF THE CHARACTERS IN THE
49                                          ;LINE
50          000110 BACK     =.
51  00110  000001          .BLK    1       ;CHARACTER TO BE PICKED WHILE GOING
52                                          ;BACKWARD (RIGHT TO LEFT)
53          000111 PRNTIN   =.
54  00111  000001          .BLK    1       ;COUNTER FOR THE NUMBER OF PRINT INTS.
55                                          ;RECEIVED
56          000112 PRCHR    =.
57  00112  000001          .BLK    1       ;CHARACTER TO BE PRINTED
58          000113 PRDIR    =.
59  00113  000001          .BLK    1       ;PRINT DIRECTION
60          000114 PRCNT    =.
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
 0010   LP201
01  00114  000001          .BLK    1       ;COUNTER FOR PRINT STEP
02          000115 PRADR    =.
03  00115  000001          .BLK    1       ;ADDRESS OF THE COLUMN TO BE PRINTED
04          000116 PRSKP    =.
05  00116  000001          .BLK    1       ;WILL BE -1 WHEN FIRST PRINT INTERRUPT
06                                          ;IS TO BE SKIPPED WHILE PRINTING
07          000117 PRTYP    =.
08  00117  000001          .BLK    1       ;FLAG FOR PRINT TYPE; BIT 0 WILL BE SET
09                                          ;FOR ELONGATED PRINT AND BIT 15 FOR COMP.
10          000120 PFMD     =.
11  00120  000001          .BLK    1       ;FLAG FOR PAPER OUT
12          000121 CMPMD    =.
13  00121  000001          .BLK    1       ;FLAG FOR COMPRESSED MODE JUMPER
14          000122 ALTMD    =.
15  00122  000001          .BLK    1       ;FLAG FOR ALT MODE JUMPER
16          000123 LDSPC    =.
17  00123  000001          .BLK    1
18          000124 PSFLG    =.
19  00124  000001          .BLK    1       ;FLAG TO COLLECT THE HORIZONTAL POSITION
20                                          ;OF THE LINE BEING SAVED IN THE PRINT
21                                          ;BUFFER WHEN THE PRINTER IS ON-LINE
22
23          000125 LNCNT    =.
24  00125  000001          .BLK    1       ;NUMBER OF LINES IN THE FORM
25          000126 LNSIZ    =.
26  00126  000001          .BLK    1
27          000127 HRTER    =.
28  00127  000001          .BLK    1       ;THIS FLAG WILL BE NON 0 WHEN THE
29                                          ;HOR. MOTOR TAKES A STEP WITHOUT
30                                          ;A STEP COMMAND
31          000130 HSTFL    =.
32  00130  000001          .BLK    1       ;FLAG FOR HORIZONTAL STEP COMMAND
33          000131 STPFL    =.
34  00131  000001          .BLK    1       ;THIS FLAG WILL CONTAIN THE NUMBER
35                                          ;OF PRINT POSITIONS BEFORE THE MOTOR
36                                          ;HAS TO BE STOPPED
37          000132 DLLF     =.
38  00132  000001          .BLK    1       ;THIS LOCATION WILL BE NON 0 IF A
39                                          ;PROGRAM IS BEING DOWN LINE LOADED
40          000133 VRTER    =.
41  00133  000001          .BLK    1       ;COUNTER FOR UNEXPECTED VERT. INT.
42          000134 OT3FL    =.
43  00134  000001          .BLK    1       ;OUT3 COMMAND ISSUED AT ANY TIME WILL
44                                          ;BE SAVED IN THIS LOCATION
45          000135 DLLSL    =.
46  00135  000001          .BLK    1       ;FLAG TO INDICATE THAT CHARACTERS BEING
47                                          ;SAVED ARE DOWN LINE LOADED CHARACTERS
48          000136 DLADR    =.
49  00136  000001          .BLK    1       ;WILL CONTAIN THE ADDRESS WHERE THE DOWN
50                                          ;LINE LOADED CHARACTER SET STARTS
51          000137 DLFLG    =.
52  00137  000001          .BLK    1       ;CONTAINS THE ADDRESS OF THE LOCATION
53                                          ;WHERE THE DOWN LINE LOADED CHAR. SET
54                                          ;WILL START AFTER PRINTING THE CHARACTER
55          000140 CMNDS    =.
56  00140  000001          .BLK    1       ;ESCAPE COMMAND BEING SAVED WILL BE
57                                          ;STORED HERE
58          000141 CMNDE    =.
59  00141  000001          .BLK    1       ;ESCAPE COMMAND BEING EXECUTED WILL BE
60                                          ;SAVED HERE
```

```
01        000142 PLTFL   =.
02 00142  000001         .BLK    1       ;FLAG TO INDICATE THAT CHARACTERS ARE
03                                        ;BEING SAVED FOR PLOTTING MODE
04        000143 PSPFL   =.
05 00143  000001         .BLK    1       ;SPECIAL FLAG FOR PLOT MODE
06        000144 PLTSL   =.
07 00144  000001         .BLK    1       ;FLAG TO INDICATE THE PLOTTING MODE IS
08                                        ;SELECTED
09        000145 VUFLG   =.
10 00145  000001         .BLK    1       ;NUMBER OF STEPS MOVED TO COMPLETE
11                                        ;THE VIEW MOTION (0 WHEN THERE HAS BEEN
12                                        ;NO MOVEMENT DUE TO VIEW)
13        000146 SCRFL   =.
14 00146  000001         .BLK    1       ;FLAG TO INDICATE THAT UNDER SCORING
15                                        ;IS ENABLED OR DISABLED
16        000147 SCOR    =.
17 00147  000001         .BLK    1       ;NON 0 WHEN THE CHARACTER BEING PRINTED
18                                        ;WILL BE UNDER SCORED
19        000150 SWTIM   =.
20 00150  000001         .BLK    1       ;TIMER TO SEE IF IT IS TIME TO READ THE
21                                        ;PANEL
22        000151 ESFLG   =.
23 00151  000001         .BLK    1       ;FLAG INDICATING THAT AN ESCAPE COMMAND IS
24                                        ;BEING SAVED
25        000152 ESFL1   =.
26 00152  000001         .BLK    1       ;FLAG INDICATING THAT AN ESCAPE COMMAND IS
27                                        ;BEING EXECUTED
28
29        000153 ESCMD   =.
30 00153  000001         .BLK    1
31        000154 ECMND   =.
32 00154  000001         .BLK    1       ;BYTE ADDRESS IN THE FIFO WHERE THE FLAG
33                                        ;FOR THE ESCAPE COMMAND WILL BE SAVED
34        000155 PSADR   =.
35 00155  000001         .BLK    1       ;BYTE ADDRESS OF THE BYTE WHERE THE LINE
36                                        ;SIZE WILL BE SAVED
37        000156 CHADR   =.
38 00156  000001         .BLK    1       ;ADDRESS OF THE BYTE COLLECTING THE
39                                        ;NUMBER OF CHARACTERS IN A LINE
40        000157 DSRFL   =.
41 00157  000001         .BLK    1       ;TIME OUT FLAG FOR DATA SET
42        000160 DTAST   =.
43 00160  000001         .BLK    1       ;TIME FOR DATA SET DISCONNECT
44        000161 ELNEN   =.
45 00161  000001         .BLK    1       ;FLAG TO REMEMBER IF THE CHARCTERS ARE
46                                        ;TO BE PRINTED IN ELONGATED MODE
47        000162 ARGFL   =.
48 00162  000001         .BLK    1       ;FIRST BYTE OF TWO BYTE ARGUMENT WILL BE
49                                        ;SAVED HERE
50        000163 AUTSK   =.
51 00163  000001         .BLK    1       ;WILL BE NON ZERO WHEN AUTO SKIP
52                                        ;FEATURE IS ENABLED
53        000164 DELAY   =.
54 00164  000001         .BLK    1       ;DELAY FOR STOP COMMAND
55        000165 VUTIM   =.
56 00165  000001         .BLK    1
57        000166 HTBFL   =.
58 00166  000001         .BLK    1       ;FLAG TO INDICATE THAT SLEW STEPS ARE
59                                        ;BEING TAKEN DUE TO A TAB
60        000167 HRCNT   =.
```

PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
COPYRIGHT DGC, 1979


```
01 00167  000001         .BLK    1       ;LOCATION WHERE THE NUMBER OF REAL TIME
02                                        ;CLOCK INTERRUPTS RECEIVED WHILE THE
03                                        ;HORIZONTAL MOTOR WAS STEPPING WILL BE
04                                        ;SAVED
05        000170 RETRY   =.
06 00170  000001         .BLK    1       ;NUMBER OF RETRYS MADE TO STEP THE MOTOR
07        000171 RTSV0   =.
08 00171  000001         .BLK    1       ;LOCATION TO SAVE AC0 WHEN A REAL TIME
09                                        ;CLOCK INTERRUPT IS RECEIVED
10        000172 RTSV3   =.
11 00172  000001         .BLK    1       ;SAVE AC3 ON A RTC INT.
12        000173 RTCRY   =.
13 00173  000001         .BLK    1       ;SAVE CARRY ON A RTC INT.
14        000174 RTCSV   =.
15 00174  000001         .BLK    1       ;HORIZONTAL COMMAND THAT FAILED WILL BE
16                                        ;SAVED HERE
17        000175 STFLG   =.
18 00175  000001         .BLK    1       ;SELF TEST FLAG
19        000176 BUFST   =.
20 00176  000001         .BLK    1       ;BUSY BUFFER
21        000177 LTOFL   =.
22 00177  000001         .BLK    1       ;LINE FLAG FOR ON LINE
23        000200 TBFL    =.
24 00200  000001         .BLK    1       ;STATUS OF TABS
25        000201 BYFLG   =.
26 00201  000001         .BLK    1       ;BUSY FLAG
27        000202 VTAB    =.
28 00202  000007         .BLK    7       ;BLOCK TO SAVE VERTICAL TAB POSITIONS.
29                                        ;EACH BIT REPRESENTS ONE LINE FEED.
30                                        ;BIT 15 IS THE LOW ORDER BIT
31        000211 HTAB    =.
32 00211  000011         .BLK    11      ;BLOCK TO SAVE HORIZONTAL TAB POSITIONS.
33                                        ;EACH BIT REPRESENTS ONE PRINT POSITION.
34                                        ;(BIT 15 IS THE LOW ORDER BIT).
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
!0013  LP201
01        061401            .DIAC   PSHA=061401
02        061601            .DIAC   POPA=061601
03        061001            .DIAC   MTSP=061001
04        060001            .DIAC   MTFP=060001
05        061201            .DIAC   MFSP=061201
06        060201            .DIAC   MFFP=060201
07        071077            .DUSR   RCTEN=71077
08        065077            .DUSR   RTCOS=65077
09        073301            .DUSR   MUL=073301
10        073101            .DUSR   DIV=073101
11        062401            .DUSR   SAV=062401
12        062601            .DUSR   RET=062601
13        100010            .DXOP   TRP=100010
14
15
16                ;UNINITIALIZED VARIABLE SPACE NOT IN PAGE 0
17        000400            .LOC    400
18 00400 000010 BIFOA:      .BLK    20/2
19 00410 000400 BIFOB:      .BLK    1000/2
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
!0014  LP201
01        040000            .LOC    40000
02              ;LOW END OF ROMS
03
04              ;BEGIN HERE WHEN POWER COMES UP (HALT, INTERUPT, JMP @1)
05 40000 040401 BEGIN:      STA     0,.+1   ;RESET INTERRUPT FLOP THIS STA WILL
06                                          ;DECODE INTO AN OUT ZERO
07
08 40001 030441             LDA     2,RTOP
09 40002 126000             ADC     1,1
10 40003 034523             LDA     3,CP0   ;INITIALIZE PAGE 0
11 40004 021377 INILP:      LDA     0,-1,2
12 40005 041400             STA     0,0,3
13 40006 133000             ADD     1,2
14 40007 137004             ADD     1,3,SZR
15 40010 000774             JMP     INILP
16                          ;GET -1 IN RAM TOP 10 WORDS (3770-3777)
17 40011 030034             LDA     2,C10   ;AC2 = 10
18 40012 046024             STA     1,@AUTIN ;AUTOINC. INITIALLY HAS 3767 IN IT
19 40013 172004             ADC     3,2,SZR ;SKIP AFTER CLEARING THE TOP TEN
20                                          ;WORDS OF THE RAM
21 40014 000776             JMP     .-2
22 40015 020567             LDA     0,STAK
23 40016 061001             MTSP    0       ;INIT. THE STACK
24 40017 020031             LDA     0,C377  ;AC0 = 377
25                          OUT     0,6,3   ;CLEAR INTERRUPTS
26 40020 034046               LDA   3,.POUT+6
27 40021 117000               ADD   0,3
28 40022 041400               STA   0,0,3
29                          IN      0,2     ;CLEAR THE FIFO
30 40023 022012               LDA   0,@.PIN+2
31 40024 020052             LDA     0,C40   ;GET STATUS BIT FOR RUN LITE
32                          OUT     0,2,3   ;SET RUN LITE BEFORE STEPPING MOTOR
33 40025 034042               LDA   3,.POUT+2
34 40026 117000               ADD   0,3
35 40027 041400               STA   0,0,3
36                          PULSE   3       ;DISABLE THE PRINT HEAD INTERRUPTS
37 40030 042043               STA   0,@.POUT+3
38 40031 034475 MRST2:      LDA     3,CP0   ;AC3 = ADDRESS AND NUMBER OF PAGE
39                                          ;0 LOCATIONS TO BE CLEARED
40 40032 164520             NEGZL   3,1
41 40033 175400             INC     3,3
42 40034 051400             STA     2,0,3   ;INITIALIZE MEM. LOCATIONS
43 40035 125404             INC     1,1,SZR
44 40036 000775             JMP     .-3
45 40037 006551             JSR     @POFLN1 ;INIT THE MACHINE STATUS
46 40040 006004             JSR     @RINIT  ;START INITIALIZING THE PRINT HEAD
47 40041 000777             JMP     .-1
48 40042 043000 RTOP:       INITA+RETA
49
```

```
01                INIT:   ;SUBROUTINE TO INITIALIZE THE HEAD
02
03 40043 054070           STA     3,TEMP3 ;SAVE THE RETURN ADDRESS
04                        IN      1,1
05 40044 026011             LDA   1,@.PIN+1
06 40045 125112           MOVL#   1,1,SZC ;SKIP IF AT HOME
07 40046 000410           JMP     LFTIN
08 40047 006057           JSR     @PDECS  ;TAKE INCREMENTAL STEPS TO THE RIGHT
09 40050 040043 PINIT:    INIT
10 40051 004431           JSR     INTRT   ;NEXT TIME RETURN .+1
11                        IN      1,1
12 40052 026011             LDA   1,@.PIN+1
13 40053 125113           MOVL#   1,1,SNC ;SKIP AFTER GOING OUT OF HOME
14 40054 000427           JMP     INTRT+1 ;RETURN
15 40055 006055           JSR     @PSTOP  ;STOP THE HORIZONTAL MOTOR
16 40056 006056 LFTIN:    JSR     @PSTEP  ;MOVE TO THE LEFT AT HIGH SPEED
17 40057 004423           JSR     INTRT
18                        IN      0,1     ;READ THE HOME FLAG
19 40060 022011             LDA   0,@.PIN+1
20 40061 101102           MOVL    0,0,SZC ;SKIP AFTER REACHING HOME
21 40062 000421           JMP     INTRT+1
22 40063 060277           INTDS
23 40064 034117           LDA     3,PRTYP ;GET THE PRINT TYPE (REGULAR OR
24                                        ;COMPRESSED)
25 40065 024037           LDA     1,C15   ;AC1 = 15
26 40066 175213           MOVR#   3,3,SNC ;SKIP IF COMP. PRINT MODE
27 40067 024034           LDA     1,C10
28 40070 044102           STA     1,HSLEW
29 40071 044101           STA     1,HPOS
30 40072 004410           JSR     INTRT   ;AFTER STOPPING THE MOTOR RETURN
31                                        ;.+1 TO START SLEW MOTION
32 40073 050127           STA     2,HRTER ;0 OUT THE HOR. ERROR FLAG
33 40074 034754           LDA     3,PINIT
34 40075 054004           STA     3,RINIT
35 40076 010113           ISZ     PRDIR   ;SKIP IF PRINTING WAS TO THE LEFT
36 40077 000571           JMP     RITPR
37 40100 120400           NEG     1,0
38 40101 000570           JMP     LFTPR   ;SLEW & THEN PREPARE TO PRINT TO
39                                        ;THE LEFT
40 40102 054004 INTRT:    STA     3,RINIT
41 40103 034036           LDA     3,C13   ;AC3 = 13
42 40104 060277           INTDS
43 40105 020134           LDA     0,OT3FL
44 40106 163400           AND     3,0     ;MASKOUT BIT 13
45 40107 040134           STA     0,OT3FL
46 40110 060177           INTEN
47 40111 002070           JMP     @TEMP3  ;RETURN
48 40112 024074 VRTTB:    LDA     1,VPOS  ;GET THE VERTICAL POSITION
49 40113 030075           LDA     2,VRSTP
50 40114 073101           DIV
51 40115 006474           JSR     @PTBCAL ;GO CALCULATE POSITION
52 40116 000202           VTAB            ;FOR NEXT VERTICAL TAB
53 40117 000007           7
54 40120 125005           MOV     1,1,SNR ;SKIP IF SOME STEPS REQUIRED
55 40121 000455           JMP     CARIG
56 40122 030075           LDA     2,VRSTP ;GET NUMBER OF STEPS PER LINE
57 40123 073301           MUL             ;CALCULATE NUMBER OF STEPS
58 40124 121000           MOV     1,0     ;FOR VERTICAL TAB
59 40125 000450           JMP     VUCNST
```

PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
COPYRIGHT DGC, 1979


```
01 40126 000066 CP0:      RETA
02 40127 034024 PFSS:     LDA     3,FRMFL ;GET STATUS OF FORM LENGTH
03 40130 175005           MOV     3,3,SNR ;SKIP IF SOME FORM LENGTH IS SET
04 40131 000445           JMP     CARIG   ;NO FORM LENGTH SET
05 40132 143000 SKAU:     ADD     2,0     ;SET UP NUMBER OF STEPS
06 40133 000442           JMP     VUCNST  ;GO TAKE STEPS
07 40134 030555           LDA     2,C3000 ;AC2 IS APROX. 3000
08 40135 050150           STA     2,SWTIM ;DISABLE THE LINE FEED AND FORM FEED
09                                        ;SWITCHES FOR SOME TIME
10                  NXTLN:  ;ENTER TO PROCESS THE NEXT LINE
11 40136 115004           MOV     0,3,SZR ;SKIP IF MOTOR HAS STOPPED
12 40137 000562           JMP     STP1
13 40140 152000           ADC     2,2
14 40141 050063           STA     2,CHRDY ;RESET THE CHARACTER READY FLAG
15 40142 030024           LDA     2,FRMFL ;AC0 = FORMS' COUNT
16 40143 034074           LDA     3,VPOS  ;AC3 = VERT. POSITION
17 40144 156443           SUBO    2,3,SNC ;SKIP IF VERTICAL POSITION HAS NOT
18                                        ;GONE OVER THE TOP OF FORM
19 40145 054074           STA     3,VPOS
20 40146 020036           LDA     0,C13
21 40147 122405           SUB     1,0,SNR ;SKIP IF NOT VERTICAL TAB
22
23 40150 000742           JMP     VRTTB
24 40151 125202           MOVR    1,1,SZC ;SKIP IF NOT A "CR"
25 40152 000424           JMP     CARIG
26 40153 020024           LDA     0,FRMFL
27 40154 101005           MOV     0,0,SNR ;SKIP IF NO FORMS OPTION
28 40155 000410           JMP     PFSSI   ;NO FORMS
29 40156 034074           LDA     3,VPOS  ;AC3 = VERTICAL POSITION
30 40157 030163           LDA     2,AUTSK ;GET THE NUMBER OF STEPS TO BE TAKEN
31                                        ;FOR AUTO SKIP MODE
32 40160 173000           ADD     3,2
33 40161 112440           SUBO    0,2     ;SET CARRY TO 0 IF AUTO SKIP IS DESIRED
34 40162 030075           LDA     2,VRSTP
35 40163 162402           SUB     3,0,SZC ;SKIP IF AUTO SKIP IS DESIRED
36 40164 000746           JMP     SKAU
37 40165 125203 PFSSI:    MOVR    1,1,SNC ;SKIP IF NOT FORM FEED
38 40166 000741           JMP     PFSS
39 40167 020075           LDA     0,VRSTP ;AC0 = NUMBER OF STEPS TO BE TAKEN
40                                        ;FOR A LINE FEED
41 40170 034143           LDA     3,PSPFL ;READ THE PLOTTING MODE SELECT SWITCH
42 40171 175004           MOV     3,3,SZR ;SKIP IF PLOTTING MODE IS NOT SELECTED
43 40172 020006           LDA     0,C5    ;AC0 = NUMBER OF STEPS FOR PLOT
44 40173 176400           SUB     3,3     ;CLEAR AC3
45 40174 054143           STA     3,PSPFL ;CLEAR PLOT STATUS
46 40175 006426 VUCNST:   JSR     @PVSTP
47 40176 024101 CARIG:    LDA     1,HPOS  ;GET THE HORIZONTAL POSITION
48 40177 010177           ISZ     LTOFL   ;SKIP IF ON LINE
49 40200 000470           JMP     RITPR   ;INITIALIZE THE CARRIAGE
50 40201 014062           DSZ     LINES   ;DECEREMENT LINE NUMBER COUNTER
51 40202 000401           JMP     .+1     ;IGNORE THE SKIP
52 40203 006411           JSR     @PGET   ;LOAD AC0 WITH THE NUMBER OF LEADING
53                                        ;SPACES, RETURN .+3
54 40204 000225 STAK:     225
55 40205 000021 C21:      21
56 40206 040106           STA     0,TEMP5 ;TEMPORARILY SAVE THE NUMBER OF LEADING
57                                        ;SPACES
58 40207 006405           JSR     @PGET   ;LOAD AC0 WITH THE ESCAPE COMMAND FLAG
59                                        ;IT WILL BE 0 IF THERE IS NO COMMAND IN
60                                        ;THE LINE
```

```
01 40210 042432 POFLN1: OFLN1
02 40211 041130 PTBCAL: TBCAL
03 40212 040103         STA     0,TEMP1 ;TEMPORARILY SAVE ESC. COMMAND FLAG
04 40213 006401         JSR     @PGET   ;LOAD AC0 WITH THE NUMBER OF CHARS.
05                                      ;IN THE NEXT LINE, RETURN .+3
06 40214 041033 PGET:   GET
07 40215 000101 C100:   101             ;NEVER RETURN HERE (EVERY "RETURN
08                                      ;AND NEW LINE WILL BE FOLLOWED
09                                      ;BY FOUR BYTES OF LOOK AHEAD INFOR-
10                                      ;MATION)
11 40216 024007         LDA     1,D132  ;AC1 = 132
12 40217 106452         SUBO#   0,1,SZC ;SKIP IF THE SIZE OF THE NEXT  LINE
13                                      ;IS NOT OVER 132 COLUMNS
14 40220 121000         MOV     1,0
15 40221 040102         STA     0,HSLEW ;SAVE THE PRINTABLE SIZE OF NEXT LINE
16 40222 006772         JSR     @PGET   ;GET THE NUMBER OF PRINTABLE CHARACTERS IN
17                                      ;IN THE LINE, RETURN .+3
18 40223 042323 PVSTP:  VRSTJ
19 40224 041014 PPRBG:  PRBG
20 40225 104000         COM     0,1
21 40226 044110         STA     1,BACK
22 40227 034161         LDA     3,ELNEN ;AC3 = PRINT TYPE
23 40230 030106         LDA     2,TEMP5 ;AC2 = NUMBER OF LEADING SPACES
24 40231 024007         LDA     1,D132. ;AC1 = 132.
25 40232 146443         SUBO    2,1,SNC ;SKIP IF NUMBER OF LEADING SPACES IS
26                                      ;GREATER THAN 132
27 40233 000403         JMP     .+3
28 40234 133000         ADD     1,2
29 40235 126400         SUB     1,1
30 40236 175112         MOVL#   3,3,SZC ;SKIP IF NOT ELONGATED MODE
31 40237 101120         MOVZL   0,0     ;MULTIPLY THE NUMBER OF CHARACTERS
32                                      ;IN THE LINE BY 2
33 40240 106452         SUBO#   0,1,SZC ;SKIP IF THE CHARACTERS WILL NOT CAUSE
34                                      ;LINE TO GO OVER 132 COLUMN
35 40241 121000         MOV     1,0
36 40242 175112         MOVL#   3,3,SZC ;SKIP IF NOT ELONGATED
37 40243 101220         MOVZR   0,0     ;DIVIDE BY 2
38 40244 024144         LDA     1,PLTSL ;AC1 = 0 IF PLOTTING MODE NOT SELECTED
39                                      ;& -1 IF IT IS SELECTED
40 40245 125223         MOVZR   1,1,SNC
41 40246 024103         LDA     1,TEMP1 ;GET THE ESC. COMMAND FLAG
42 40247 125235         MOVZR#  1,1,SNR ;SKIP IF THERE IS A COMMAND TO
43                                      ;ENABLE THE ELONGATED PRINT IN
44                                      ;THIS LINE
45 40250 040107         STA     0,CHCNT ;NUMBER OF PRINTABLE CHARACTERS IN
46                                      ;THE LINE
47 40251 134445         NEGO    1,3,SNR ;SKIP IF THERE IS A ESCAPE COMMAND
48                                      ;IN THE LINE AND PREPARE TO PRINT
49                                      ;LEFT TO RIGHT
50 40252 034062         LDA     3,LINES ;AC3 = NUMBER OF LINES IN THE
51                                      ;BUFFER
52 40253 165100         MOVL    3,1     ;IF THERE ARE NO MORE LINES IN THE
53                                      ;PRINT BUFFER THEN MAKE THE CARRY 1
54 40254 101105         MOVL    0,0,SNR ;SKIP IF THERE ARE SOME PRINTABLE
55                                      ;CHARACTERS IN THE LINE OR THIS IS THE
56                                      ;ONLY LINE IN THE BUFFER
57 40255 000415         JMP     LFTPR+1
58 40256 024101         LDA     1,HPOS  ;GET THE HORIZONTAL POSITION
59 40257 146426         SUBZ    2,1,SEZ ;SKIP IF THE NUMBER OF LEADING
60                                      ;SPACES IS EQUAL OR MORE THAN THE
```



```
01                                      ;CURRENT HORIZONTAL POSITION
02 40260 175102         MOVL    3,3,SZC ;SKIP IF THERE ARE MORE LINES IN THE
03                                      ;PRINT BUFFER OR THERE IS NO ESCAPE
04                                      ;;COMMAND IN THE LINE
05 40261 000407         JMP     RITPR   ;NEXT LINE IS TO BE PRINTED LEFT
06                                      ;TO RIGHT
07 40262 020102         LDA     0,HSLEW ;AC0 = FINAL POSITION OF THE LINE
08 40263 142400         SUB     2,0     ;AC0 = TOTAL NUMBER OF PRINT COLUMNS
09                                      ;OCCUPIED BY THE CHARACTERS IN THE LINE
10 40264 106052         ADCO#   0,1,SZC ;SKIP IF THE NUMBER OF CHAR. IN
11                                      ;THE LINE ARE LESS THAN THE CURRENT
12                                      ;HORIZONTAL POSITION
13 40265 101400         INC     0,0     ;IF THE NEXT LINE HAS TO START AT
14                                      ;THE CURRENT PRINT POSITION, OR IF
15                                      ;THE HEAD IS TO MOVE TO THE RIGHT
16                                      ;THEN TAKE ONE EXTRA SLEW STEP
17 40266 122440         SUBO    1,0     ;CARRY = 1 IF AC0 < AC1 IN WHICH
18                                      ;CASE AC0 WILL BECOME -IVE; OTHER-
19                                      ;WISE CARRY = 0 AND AC0 WILL BE +IVE
20 40267 106413         SUB#    0,1,SNC ;SKIP IF MOVING THE PRINTER TO THE
21                                      ;RIGHT IS INEFFICIENT
22 40270 120401 RITPR:  NEG     1,0,SKP
23 40271 176001 LFTPR:  ADC     3,3,SKP ;AC3 = -1
24 40272 176520         SUBZL   3,3     ;AC3 = 1
25 40273 054113         STA     3,PRDIR ;"PRDIR" WILL BE 1 IF THE PRINT
26                                      ;DIRECTION IS GOING TO BE RIGHT AND
27                                      ;-1 IF IT IS GOING TO BE LEFT
28 40274 126400 VURST:  SUB     1,1
29 40275 044170         STA     1,RETRY ;CLEAR THE ERROR FLAG FOR RETRYS
30 40276 044145         STA     1,VUFLG ;CLEAR THE FLAG TO INDICATE THAT
31                                      ;VIEW HAS TAKEN PLACE
32 40277 024676         LDA     1,VUCNST        ;GET THE VIEW CONSTANT
33 40300 044165         STA     1,VUTIM ;INIT THE VIEW TIMER
34 40301 105102 VUSLU:  MOVL    0,1,SZC ;SKIP IF SLEW DIRECTION IS TO
35                                      ;THE RIGHT
36 40302 100400         NEG     0,0     ;AC0 = NUMBER OF SLEW STEPS
37 40303 126200         ADCR    1,1     ;AC1 IS -1 IF SLEW DIRECTION IS TO
38                                      ;THE LEFT AND 77777 IF IT IS TO THE
39                                      ;RIGHT
40 40304 136415         SUB#    1,3,SNR ;AC3 WILL ONLY BE 0 WHEN BOTH
41                                      ;SLEW AND PRINT WILL BE IN THE
42                                      ;REVERSE DIRECTION, IN WHICH CASE
43                                      ;THE SLEW STEP HAS TO BE REDUCED BY 1
44 40305 163000         ADD     3,0
45 40306 040102         STA     0,HSLEW ;SAVE THE NUMBER OF HORIZONTAL
46                                      ;SLEW STEPS
47 40307 111005         MOV     0,2,SNR ;SKIP IF SOME SLEW STEPS ARE TO
48                                      ;BE TAKEN
49 40310 000560         JMP     SCAN
50 40311 002713 C3000:  JMP     @PPRBG
51
52 40312 024130 SLCHK:  LDA     1,HSTFL ;GET THE LAST HORIZ. STEP THAT
53                                      ;WAS ISSUED
54 40313 030005         LDA     2,C4    ;AC2 = 4
55 40314 147404         AND     2,1,SZR ;SKIP IF MOVING TO RIGHT
56 40315 126000         ADC     1,1     ;AC1 = -1
57 40316 034033         LDA     3,C7    ;AC3 = 7
58 40317 116443         SUBO    0,3,SNC ;SKIP IF MORE THAN 7 CHARS. POSITIONS
59                                      ;LEFT IN THE SLEW MOTION
60 40320 006057         JSR     @PDECS  ;START SLOW STEPS AND RETURN
```

```
01 40321 111004 STP1:   MOV     0,2,SZR ;SKIP IF THE HORIZONTAL MOTOR IS NOT
02                                      ;STEPPING
03 40322 030005         LDA     2,C4
04 40323 050131         STA     2,STPFL ;PREPARE TO SLOW DOWN AND STOP AFTER
05                                      ;4 PRINT POSITIONS
06 40324 000544         JMP     SCAN
07
08 40325 040134 PNXT:   NXTLN-2
09 40326 044177 LNFR1:  STA     1,LTOFL ;PRETEND TO BE OFF LINE
10 40327 132043         ADCO    1,2,SNC ;SKIP IF THE COUNT WAS 0
11 40330 000513         JMP     LNFR2
12 40331 175213         MOVR#   3,3,SNC ;SKIP IF NEW LINE IS NOT DESIRED
13 40332 125521         INCZL   1,1,SKP ;AC1 = 2
14 40333 175113         MOVL#   3,3,SNC ;SKIP IF FORMFEED IS NOT DESIRED
15 40334 002771         JMP     @PNXT
16 40335 000507         JMP     LNFR2+1
17 40336 050120 HDINT:  STA     2,PFMD  ;SET STATUS OF OUT OF FORMS
18 40337 000404         JMP     SNBY+1  ;SEND BUSY TO HOST
19 40340 020030 SNBYA:  LDA     0,C1000 ;SET COUNT FOR BUFFER CLEAR
20 40341 040176         STA     0,BUFST
21 40342 152001 SNBY:   ADC     2,2,SKP ;MAKE AC2 EQUAL TO -1
22 40343 030031         LDA     2,C377  ;MAKE AC2 = 377
23 40344 050201         STA     2,BYFLG ;SET BUSY FLAG
24              SERBY:  IN      0,4
25 40345 022014           LDA   0,@.PIN+4
26 40346 030065         LDA     2,C2
27 40347 143404         AND     2,0,SZR ;SKIP IF SOFEWARE BUSY
28 40350 001400         JMP     0,3
29 40351 020436         LDA     0,C23   ;SEND SOFTWARE BUSY TO HOST
30 40352 030201         LDA     2,BYFLG
31 40353 151005         MOV     2,2,SNR ;TEST FOR CLEAR OR BUSY
32 40354 020631         LDA     0,C21   ;SEND CLEAR
33                      OUT     0,1,2
34 40355 030041           LDA   2,.POUT+1
35 40356 113000           ADD   0,2
36 40357 041000           STA   0,0,2
37 40360 001400         JMP     0,3     ;RETURN AFTER SENDING BUSY
38              DSCNCT: ;**COME HERE TO DISCONECT THE DATA SET
39 40361 034160         LDA     3,DTAST ;GET THE DATA SET TIMER
40 40362 175005         MOV     3,3,SNR ;SKIP IF THE TIMER IS ON
41 40363 034556         LDA     3,DSRTM ;PREPARE TO INIT THE TIMER
42 40364 175405         INC     3,3,SNR ;SKIP WHEN THE TIME IS OVER
43 40365 054157         STA     3,DSRFL ;PREPARE TO RETURN FOR ISSUING
44                                      ;ANOTHER BREAK
45 40366 054160         STA     3,DTAST
46              OTWO:   OUT     0,2,2   ;ISSUE A BREAK
47 40367 030042           LDA   2,.POUT+2
48 40370 113000           ADD   0,2
49 40371 041000           STA   0,0,2
50 40372 030623         LDA     2,C100  ;GET ERROR STATUS
51 40373 112404         SUB     0,2,SZR ;TEST FOR ERROR
52 40374 000474         JMP     SCAN    ;NO ERROR RETURN TO SCAN
53 40375 102400 HELP:   SUB     0,0     ;CLEAR AC0
54 40376 006055         JSR     @PSTOP  ;STOP THE MOTORS THIS IS AN ERROR
55 40377 004743         JSR     SNBY    ;SEND BUSY TO HOST THIS IS AN ERROR
56 40400 020615         LDA     0,C100  ;GET ERROR STATUS
57 40401 000766         JMP     OTWO    ;SET ERROR LIGHT ISSUE BREAK
58                                      ;RESET RUN LED ON CONTROL BOARD
59 40402 020402 RTSND:  LDA     0,C76
60 40403 000764         JMP     OTWO
```

PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
COPYRIGHT DGC, 1979


```
01 40404 000074 C76:    74      ;CONSTANTS
02 40405 000057 C57:    57
03 40406 000174 D128:   124.
04 40407 000023 C23:    23
05 40410 000076 C74:    76
06 40411 041231 PRDTTO: RDTTO
07 40412 042644 PTEST:  TESTS
08 40413 042630 PBELL:  BELL
09 40414 040340 SNBYZ:  SNBYA
10 40415 000046 C44:    46
11 40416 041035 GET4:   GET1
```

```
01 40417 034114 EMPTY:  LDA     3,PRCNT
02 40420 161004         MOV     3,0,SZR ;SKIP IF PRINTING OF THE LAST
03                                      ;CHARACTER IS OVER
04 40421 000447         JMP     SCAN
05                      IN      3,4
06 40422 036014           LDA   3,@.PIN+4
07 40423 177320         ADDZS   3,3     ;LOAD CARRY WITH 1 IF VIEW MODE IS
08                                      ;ENABLED, 0 OTHERWISE
09 40424 024165         LDA     1,VUTIM ;AC1 = VIEW TIME
10 40425 125006         MOV     1,1,SEZ ;SKIP IF NO VIEW DESIRED OR THE VIEW
11                                      ;MOTION HAS ALREADY TAKEN PLACE
12 40426 014165         DSZ     VUTIM   ;SKIP IF TIME TO MOVE FOR VIEW
13 40427 000410         JMP     LNFRM   ;OTHERWISE GO TO CHECK FOR LINE FEED
14                                      ;OR FORM FEED SWITCHES
15 40430 020033         LDA     0,C7    ;AC0 = 7
16 40431 024101         LDA     1,HPOS  ;READ THE HORIZONTAL POSITION
17 40432 030754         LDA     2,D128  ;AC2 = 128.
18 40433 132442         SUBO    1,2,SZC ;SKIP IF LESS THAN 128.
19 40434 100000         COM     0,0     ;OTHERWISE VIEW MODE WILL MOVE THE
20                                      ;CARRIAGE TO THE LEFT
21 40435 040145         STA     0,VUFLG
22 40436 000643         JMP     VUSLU
23
24 40437 024073 LNFRM:  LDA     1,VSLEW
25 40440 030150         LDA     2,SWTIM ;READ THE SWITCH COUNT,IT HAS TO
26                                      ;BE 0 FOR THE SWITCH TO BE READ
27 40441 125005         MOV     1,1,SNR ;SKIP IF VERTICAL MOTION IS TAKING
28                                      ;PLACE
29 40442 000664         JMP     LNFR1
30 40443 050150 LNFR2:  STA     2,SWTIM
31 40444 030130         LDA     2,HSTFL ;GET THE LAST HORIZONTAL COMMAND THAT
32                                      ;WAS ISSUED
33 40445 151005         MOV     2,2,SNR ;SKIP IF THE MOTOR IS MOVING
34 40446 000422         JMP     SCAN
35 40447 006055         JSR     @PSTOP  ;STOP THE MOTOR
36 40450 065077         RTCDS           ;DISABLE THE REAL TIME CLOCK
37 40451 020107         LDA     0,CHCNT ;SEE IF CHARACTERS ARE IN BUFFER
38 40452 101005         MOV     0,0,SNR ;SKIP IF THE STOP WAS ISSUED BECAUSE THE
39                                      ;PRINTER WENT OFF LINE WHILE IT WAS
40                                      ;PRINTING THE CHARACTERS ON LINE
41 40453 024031         LDA     1,C377
42 40454 000417         JMP     SCAN+3
43 40455 020201 OFLST:  LDA     0,BYFLG
44 40456 101015         MOV#    0,0,SNR ;TEST IF BUSY IS SET
45 40457 004664         JSR     SNBY+1  ;SEND BUSY TO HOST
46 40460 020735         LDA     0,C44   ;GET OFF LINE STATUS
47 40461 000425         JMP     OFRET   ;RETURN TO SCAN
48
49 40462 102400 SNCL:   SUB     0,0     ;CLEAR AC0
50 40463 040201         STA     0,BYFLG ;CLEAR BUSY FLAG
51 40464 040120         STA     0,PFMD  ;CLEAR FORM ERROR
52 40465 004660         JSR     SERBY   ;GO CHECK ON WHICH CLEAR
53 40466 000402         JMP     SCAN    ;RETURN TO SCAN
54 40467 040152 ESCST:  STA     0,ESFL1 ;SET A FLAG TO INDICATE THAT AN
55                                      ;ESCAPE COMMAND IS BEING DECODED
56
57
58
59
60
```

PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
COPYRIGHT DGC, 1979


```
01                      SCAN:   ;LOOK FOR SOMETHING TO DO
02 40470 176400                 SUB     3,3
03 40471 024164         LDA     1,DELAY
04 40472 166043         ADC0    3,1,SNC ;SKIP IF DELAY STARTED AFTER
05                                      ;THE STOP COMMAND IS OVER
06 40473 044164         STA     1,DELAY
07 40474 014061         DSZ     BLCNT   ;SKIP IF THE BELL IS NOT TO BE RUNG
08 40475 006716         JSR     @PBELL  ;RING THE BELL
09 40476 010061         ISZ     BLCNT   ;MAKE IT 1 FOR NEXT TIME'S SKIP
10 40477 030071         LDA     2,VRTWT
11 40500 151224         MOVZR   2,2,SZR ;DECREMENT BUT DON'T MAKE IT NEGATIVE
12 40501 014071         DSZ     VRTWT   ;"VRTWT" WILL BECOME 0 WHEN THE VERTICAL
13                                      ;WAIT IS OVER
14                      IN      1,4     ;GET THE STATUS
15 40502 026014           LDA   1,@.PIN+4
16 40503 020705         LDA     0,C74   ;AC0 = 74
17 40504 127103         ADDL    1,1,SNC ;SKIP IF PRINTER IS ON LINE
18 40505 000750         JMP     OFLST   ;GO CHECK ON BUSY STATUS
19 40506 152200 OFRET:  ADCR    2,2     ;AC2 = -1 FOR ON LINE AND 77777 FOR OFF
20                                      ;LINE
21 40507 050104         STA     2,TEMP2 ;TEMP2 WILL BE -1 FOR ON LINE, BIT 0
22                                      ;WILL BE 0 FOR OFF LINE
23 40510 034177         LDA     3,LTOFL ;LINE TERMINATOR STATUS
24 40511 030031         LDA     2,C377
25 40512 156414         SUB#    2,3,SZR ;SKIP IF TERMINATOR
26 40513 030104         LDA     2,TEMP2 ;GET ON/OFF LINE STATUS
27 40514 034063         LDA     3,CHRDY
28 40515 175405         INC     3,3,SNR ;SKIP IF READY TO PRINT CHARACTER
29 40516 050177         STA     2,LTOFL ;UPDATE TERMINATOR STATUS
30 40517 034175         LDA     3,STFLG ;GET STATUS OF SELF TEST
31 40520 175112         MOVL#   3,3,SZC ;SKIP IF NOT IN SELF TEST MODE
32 40521 020674         LDA     0,C44   ;GET READY RUN LITE STATUS
33 40522 034006         LDA     3,C5
34 40523 030201         LDA     2,BYFLG ;GET STATUS OF BUSY
35 40524 151014         MOV#    2,2,SZR ;TEST FOR BUSY
36 40525 162000         ADC     3,0     ;IF BUSY MAKE STATUS RTS NOT READY
37 40526 030104         LDA     2,TEMP2 ;RESTORE AC2
38 40527 034160         LDA     3,DTAST ;CHECK IF BREAK WAS TAKING PLACE
39 40530 175004         MOV     3,3,SZR
40 40531 020654         LDA     0,C57   ;SET BIT 15 FOR BREAK
41                      OUT     0,2,3
42 40532 034042           LDA   3,.POUT+2
43 40533 117000           ADD   0,3
44 40534 041400           STA   0,0,3
45 40535 135300         MOVS    1,3
46 40536 175113         MOVL#   3,3,SNC ;SKIP IF ON LINE AND DSR IS NOT ZERO
47 40537 000407         JMP     SCAN3
48 40540 034157         LDA     3,DSRFL ;GET THE DATA SET READY FLAG
49 40541 175005 DSRTM:  MOV     3,3,SNR ;SKIP IF NO CHARACTER HAS BEEN RECEIVED
50                                      ;SINCE THE TIMER STARTED
51 40542 175400         INC     3,3     ;OTHERWISE LOAD THE VALUE OF THE TIMER
52 40543 175405         INC     3,3,SNR ;SKIP IF THE WAIT TIME IS NOT OVER
53 40544 000615         JMP     DSCNCT  ;DISCONNECT THE DATA SET
54 40545 054157         STA     3,DSRFL
55 40546 147503 SCAN3:  ANDL    2,1,SNC ;CARRY = 0 IF NO CHARACTER TO BE
56                                      ;READ OR IF OFF LINE
57 40547 000417         JMP     SCAN0
58 40550 034053         LDA     3,C60
59 40551 020201         LDA     0,BYFLG ;GET BUSY STATUS
60 40552 117414         AND#    0,3,SZR ;TEST IF BUSY
```

```
40553 000410          JMP     SCAN4
40554 020022          LDA     0,FIFOB+LO
40555 162023          ADCZ    3,0,SNC ;TEST IF FIFOB IS FULL
40556 006636          JSR     @SNBYZ  ;SEND BUSY TO HOST
40557 006632 SCAN5:   JSR     @PROTTO ;GO READ IN CHARACTER
40560 000406          JMP     SCAN0
40561 042430 POFLO:   OFLN0
40562 040312 PSLCHK:  SLCHK
             SCAN4:   IN      0,4     ;GET STATUS
40563 022014             LDA   0,@.PIN+4
40564 101203          MOVR    0,0,SNC ;TEST FOR SERIAL INTERFACE
40565 000772          JMP     SCAN5   ;SERIAL GO GET DATA
40566 147503 SCAN0:   ANDL    2,1,SNC ;CARRY = 0 IF THE UART IS BUSY OR OFF
                                      ;LINE, 1 OTHERWISE
40567 000432          JMP     SCAN1
40570 127123          ADDZL   1,1,SNC ;SKIP IF CLEAR TO SEND
40571 000611          JMP     RTSND   ;REQUEST TO SEND
40572 044066          STA     1,RETA  ;TEMPORARILY SAVE THE IN4
40573 020031          LDA     0,C377
                      IN      3,3
40574 036013             LDA   3,@.PIN+3
40575 175102          MOVL    3,3,SZC ;SKIP IF OUT OF FORMS
40576 034201          LDA     3,BYFLG ;GET STATUS OF BUSY
40577 116415          SUB#    0,3,SNR ;TEST TO SEE IF BUFFER WAS FULL
40600 000662          JMP     SNCL    ;SEND CLEAR TO HOST
40601 020175          LDA     0,STFLG ;GET STATUS OF SELF TEST
40602 101112          MOVL#   0,0,SZC ;SKIP IF NOT IN SELF TEST
40603 006607          JSR     @PTEST  ;PUT DATA IN FIFOB
40604 034063          LDA     3,CHRDY ;AC3 WILL HAVE THE CHARACTER BEING
                                      ;PRINTED OR -1 IF NO CHARACTER IS
                                      ;BEING PRINTED

40605 175415          INC#    3,3,SNR ;IF LOCAL COPY IS REQUIRED THEN CHECK
                                      ;THE PRINT BUFFER TO SEE THAT IT CAN
                                      ;ACCEPT THE CHARACTER
40606 006610          JSR     @GET4   ;READ THE CHARACTER FROM THE KEYBOARD
                                      ;FIFO [FIFOA] IF CHARACTER IS AVAILABLE
                                      ;IN THE KEYBOARD FIFO THEN RETURN .+2

40607 000412          JMP     SCAN1
40610 024066          LDA     1,RETA  ;READ THE SAVED IN4
40611 125103          MOVL    1,1,SNC ;SKIP IF LOCAL COPY DESIRED
40612 000404          JMP     SCOTH
40613 040063          STA     0,CHRDY
40614 034031          LDA     3,C377
40615 054177          STA     3,LTOFL ;SET UP FOR LINE TERM
              SCOTH:  OUT     0,1,3   ;SEND CHAR TO HOST
40616 034041             LDA   3,.POUT+1
40617 117000             ADD   0,3
40620 041400             STA   0,0,3
40621 024166 SCAN1:   LDA     1,HTBFL
40622 020102          LDA     0,HSLEW
40623 125005          MOV     1,1,SNR ;SKIP IF SLEW MOTION IS DUE TO
                                      ;A TAB COMMAND
40624 101005          MOV     0,0,SNR ;SKIP IF SLEW STEPS ARE BEING TAKEN
40625 000402          JMP     .+2
40626 002734          JMP     @PSLCHK
40627 024131          LDA     1,STPFL
40630 125004          MOV     1,1,SZR ;WAIT FOR THE STOP COMMAND TO COMPLETE
40631 000637          JMP     SCAN
```

PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
COPYRIGHT DGC, 1979


```
40632 020063          LDA     0,CHRDY
40633 101414          INC#    0,0,SZR ;SKIP IF THERE IS NO CHARACTER READY
                                      ;FOR PRINTING
40634 000440          JMP     GTIT1
40635 151525          INCZL   2,2,SNR ;SKIP IF ON LINE
40636 006723 BLCNST:  JSR     @POFLO  ;SET UP THE MACHINE STATUS & RETURN
                                      ;.+8
40637 030107          LDA     2,CHCNT ;AC2 = CHARACTERS LEFT IN THE LINE
40640 143043          ADDO    2,0,SNC ;DECREMENT BUT DON'T MAKE IT NEGATIVE
40641 040107          STA     0,CHCNT
40642 024113          LDA     1,PRDIR ;AC1 IS -1 IF PRINT DIRECTION IS
                                      ;TO THE LEFT AND 1 OTHERWISE
40643 125415          INC#    1,1,SNR ;SKIP IF PRINTING TO RIGHT
40644 000407          JMP     LIFO    ;LAST CHARACTER IN THE LINE WILL
                                      ;BE PRINTED FIRST
40645 004566          JSR     GET     ;LOAD AC0 WITH A CHARACTER FROM
                                      ;FIFOB RETURN .+2 OR .+3
40646 004567          JSR     GET1    ;LOAD AC0 WITH A CHARACTER FROM
                                      ;FIFOA
40647 002554          JMP     @EMPT1  ;JUMP IF FIFO IS EMPTY
40650 000412          JMP     GOTIT
40651 040274 PVURST:  VURST
40652 040467 PESCT:   ESCST

40653 140445 LIFO:    NEGO    2,0,SNR ;SKIP IF THIS IS NOT THE LAST
                                      ;CHARACTER IN THE LINE, OTHERWISE
                                      ;SET THE CARRY TO 0
40654 020110          LDA     0,BACK  ;AC0 = COMPLEMENT OF THE NUMBER OF
                                      ;CHARACTERS IN THE LINE
40655 030050          LDA     2,PFIFB ;AC2 = POINTER TO FIFOB
40656 025002          LDA     1,LO,2
40657 106403          SUB     0,1,SNC ;SKIP IF NOT END OF THE LINE
40660 045002          STA     1,LO,2
40661 004564          JSR     GET2    ;GET THE NEXT CHARACTER TO BE PRINT-
                                      ;ED WHILE GOING BACKWARD
              GOTIT:  IN      2,4
40662 032014             LDA   2,@.PIN+4
40663 153113          ADDL#   2,2,SNC ;TEST FOR ON LINE
40664 000407          JMP     GTIT1-1 ;DO NOT CHECK ESC OFFLINE
40665 030152          LDA     2,ESFL1 ;ESFLI WILL BE 0 IF THERE IS NO
                                      ;ESCAPE COMMAND BEING DECODED
40666 151004          MOV     2,2,SZR ;SKIP IF NO ESCAPE COMMAND IS BEING
                                      ;DECODED
40667 002533          JMP     @PESDCD ;DECODE THE ESCAPE COMMAND
40670 030051          LDA     2,C33   ;AC2 = 33
40671 112415          SUB#    0,2,SNR ;SKIP IF IT WAS NOT STARTING OF AN
                                      ;ESCAPE COMMAND
40672 002760          JMP     @PESCT  ;SET ESFL1
40673 040063          STA     0,CHRDY ;CHRDY IS THE NEXT CHAR. TO BE
                                      ;PRINTED
40674 030120 GTIT1:   LDA     2,PFMD  ;GET STATUS OF OUT OF FORMS
40675 151004          MOV     2,2,SZR ;SKIP IF FORMS OK
40676 002525          JMP     @EMPT1  ;FORM ERROR RETURN TO SCAN
40677 020145          LDA     0,VUFLG ;GET VIEW FLAG
40700 100404          NEG     0,0,SZR ;SKIP IF CARRIAGE WAS NOT MOVED FOR
                                      ;THE VIEW
40701 002750          JMP     @PVURST ;OTHERWISE RESET THE CARRIAGE
40702 024127          LDA     1,HRTER ;GET THE HEAD ERROR FLAG
40703 125004          MOV     1,1,SZR ;SKIP IF THE HEAD WAS NOT MOVED
40704 000520          JMP     TOINT   ;RESET THE HEAD
```

```
01 40705 030114          LDA     2,PRCNT ;GET THE PRINT STEPS
02 40706 151234          MOVZR#  2,2,SZR ;TEST FOR COUNT OF ONE
03 40707 000407          JMP     GTIT2   ;NO NOT ONE
04 40710 020063          LDA     0,CHRDY
05 40711 034032          LDA     3,C177  ;MAKE AC3 EQUAL TO 177
06 40712 116440          SUBO    0,3     ;SET UP DATA FOR TAB
07 40713 024113          LDA     1,PRDIR ;GET THE PRINT DIRECTION
08 40714 174406          NEG     3,3,SEZ ;SKIP IF TAB IS NOT TO TAKE PLACE
09 40715 000554          JMP     TBDCD   ;GO TO SET SLEW MODE FOR TAB
10 40716 151005 GTIT2:   MOV     2,2,SNR ;SKIP IF CHARACTER IS NOT COMPLETELY
11                                       ;PRINTED
12 40717 030073          LDA     2,VSLEW
13 40720 151004          MOV     2,2,SZR ;SKIP IF A VERTICAL STEP IS NOT BEING
14                                       ;TAKEN
15 40721 002060          JMP     @PSCAN
16 40722 050200          STA     2,TBFL  ;SET STATUS OF TAB TO ZERO
17 40723 050150          STA     2,SWTIM ;RESET THE FLAG TO TIME THE LINEFEED
18                                       ;AND FORMFEED SWITCHES
19 40724 020130          LDA     0,HSTFL ;AC0 = HORIZ. COMMAND
20 40725 024063          LDA     1,CHRDY
21 40726 034036          LDA     3,C13   ;AC3 = 13
22 40727 136654          SUBOR#  1,3,SZR ;SKIP IF A LF OR VERTICAL TAB
23 40730 034037          LDA     3,C15   ;AC3 = 15
24 40731 136645          SUBOR   1,3,SNR ;SKIP IF NOT A CR OR FF
25 40732 002557          JMP     @PNXTLN ;START THE NEXT LINE
26 40733 030144          LDA     2,PLTSL ;GET PLOT MODE FLAG
27 40734 151004          MOV     2,2,SZR ;SKIP IF NOT IN PLOT MODE
28 40735 000473          JMP     TPMF    ;SET SPECIAL STATUS FOR PLOT MODE
29 40736 151405 TPMFA:   INC     2,2,SNR ;TEST TO SEE IF LINE IS TERMINATED
30 40737 002060          JMP     @PSCAN  ;NOT YET RETURN TO SCAN
31 40740 152000          ADC     2,2     ;MAKE AC2 = -1
32 40741 050063          STA     2,CHRDY ;RESET THE CHARACTER READY FLAG
33 40742 174065          COMC    3,3,SNR ;SKIP IF NOT A COMMAND RELATED TO
34                                       ;ALTERNATE CHARACTER 16 OR 17
35 40743 002456          JMP     @PALTNT ;EXECUTE THE ALTERNATE CHARACTER
36                                       ;COMMAND GO WITH CARRY=0 TO SELECT
37                                       ;AND 1 TO DESELECT
38 40744 044112          STA     1,PRCHR
39 40745 024113          LDA     1,PRDIR ;GET PRINT DIRECTION
40 40746 034101          LDA     3,HPOS  ;GET THE HORIZONTAL POSITION
41 40747 130142          COMOL   1,2,SZC ;SKIP IF MOVING TO THE LEFT WITH
42                                       ;CARRY = 0 AND AC2 = 1
43 40750 030007          LDA     2,D132  ;AC2 = 132.
44 40751 156407          SUB     2,3,SBN ;SKIP IF "HPOS" IS LESS THAN 132
45                                       ;AND THE PRINT DIRECTION IS TO
46                                       ;THE RIGHT OR IT IS MORE THAN 1
47                                       ;AND THE PRINT DIRECTION IS TO LEFT
48 40752 002540          JMP     @PSTP1  ;IF 132 CHARACTERS HAVE BEEN PRINTED
49                                       ;THEN GO TO STOP THE MOTOR
50 40753 030146          LDA     2,SCRFL ;PREPARE TO SET UNDER SCORE FLAG
51 40754 050147          STA     2,SCOR
52 40755 030137          LDA     2,DLFLG
53 40756 050136          STA     2,DLADR ;SELECT/DESELECT DOWN LINE LOADED
54                                       ;CHARACTER SET
55 40757 030161          LDA     2,ELNEN ;READ THE FLAG FOR ELONGATED PRINT. BIT
56                                       ;0 WILL BE SET IF THE NEXT CHARACTER IS
57                                       ;TO BE PRINTED UNDER ELONGATED MODE
58 40760 034117          LDA     3,PRTYP
59 40761 175100          MOVL    3,3     ;MASKOUT BIT 0
60 40762 151100          MOVL    2,2     ;BIT 0 WILL REPRESENT ELONGATED PRINT
```

PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
COPYRIGHT DGC, 1979


```
01 40763 175200          MOVR    3,3
02 40764 054117          STA     3,PRTYP ;SAVE THE PRINT TYPE; 0 FOR REG. PRINT
03                                       ;BIT 15 WILL BE 1 FOR COMP. PRINT, AND
04                                       ;BIT 0 WILL BE SET FOR ELONGATED PRINT
05 40765 151100          MOVL    2,2     ;LOAD CARRY WITH THE STATE OF ELONGATED
06                                       ;PRINT MODE
07 40766 030033          LDA     2,C7
08 40767 125113          MOVL#   1,1,SNC ;SKIP IF MOVING TO LEFT
09 40770 152560          SUBCL   2,2
10 40771 050115          STA     2,PRADR ;INIT. THE ADDRESS OF THE PRINT
11                                       ;COLUMN
12 40772 030034          LDA     2,C10   ;AC2=10
13 40773 143444          ANDO    2,0,SZR ;AC0 = NON 0 ONLY IF STEPPING AT HIGH
14                                       ;SPEED
15 40774 141220          MOVZR   2,0     ;AC0 = 4
16 40775 175102          MOVL    3,3,SZC ;SKIP IF NOT ELONGATED
17 40776 030037          LDA     2,C15
18 40777 050114          STA     2,PRCNT ;SET PRINT COUNT
19 41000 010177          ISZ     LTOFL   ;SKIP IF ON LINE
20 41001 000512          JMP     OFLN2
21 41002 030107          LDA     2,CHCNT ;AC2 = NUMBER OF CHARACTERS LEFT IN
22                                       ;THE LINE TO BE PRINTED
23 41003 034110          LDA     3,BACK
24 41004 157000          ADD     2,3     ;AC3 = NUMBER OF CHARACTERS PRINTED
25                                       ;SO FAR
26 41005 101004          MOV     0,0,SZR ;SKIP IF THE PRINT HEAD IS NOT MOVING
27                                       ;AT HIGH SPEED
28 41006 117053          ADDO#   0,3,SNC ;SKIP IF FIRST 4 CHARACTERS PRINTED
29 41007 102021 RTOFL:   ADCZ    0,0,SKP ;AC0 = -1
30 41010 101420          INCZ    0,0     ;AC0 = 5
31 41011 040116          STA     0,PRSKP ;SET THE FLAG TO SKIP
32 41012 112016 SCAN2:   ADC#    0,2,SEZ ;SKIP IF THE MOTOR IS NOT STEPPING
33                                       ;OR THERE ARE LESS THAN 7 CHARACTERS
34                                       ;IN THE LINE
35 41013 002060          JMP     @PSCAN
36 41014 034033 PRBG:    LDA     3,C7    ;AC3 = 7
37 41015 172052          ADCO#   3,2,SZC ;SKIP IF THERE ARE 6 OR LESS CHAR.
38 41016 006057          JSR     @PDECS  ;START DECELERATED STEPS
39 41017 006056          JSR     @PSTEP  ;START INC. STEPS
40 41020 002060          JMP     @PSCAN
41 41021 041724 PALTNT:  ALTNT
42 41022 041556 PESDCD:  ESCEX
43 41023 040417 EMPTI:   EMPTY
44 41024 125400 TOINT:   INC     1,1
45 41025 152400          SUB     2,2
46 41026 006004          JSR     @RINIT  ;INITIALIZE THE HEAD
47 41027 002060          JMP     @PSCAN  ;MOVED BY HAND
48 41030 050143 TPMF:    STA     2,PSPFL ;SET SPECIAL FLAG FOR PLOT MODE
49 41031 030062          LDA     2,LINES ;GET LINE STATUS OF BUFFER
50 41032 000704          JMP     TPMFA   ;RETURN TO MAIN
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
10027  LP201
01                GET:    ;**GET CHAR INTO AC0 FROM FIFOB
02                        ;GET1 TO LOAD AC0 FROM FIFOA
03                        ;PICTURE OF A TYPICAL FIFO (RING BUFFER)
04                        ;MASK:  N -1            ;NUMBER OF BYTES IN FIFO
05                        ;LI:    0               ;OFFSET FROM BASE IN BYTES
06                                                ;TO LAST CHAR PUT IN.
07                        ;LO:    N               ;OFFSET FROM LI IN BYTES
08                                                ;TO LAST CHAR GOTTEN OUT.
09                        ;       BASE*2          ;BYTE POINTER TO BUFFER
10                        ;...
11                        ;BASE:  .BLK            ;STARTING ADDRESS OF BUFFER
12                                                ;ITSELF AND ITS LENGTH.
13                        ;LOSES AC1, AC2, CARRY
14 41033 030050           LDA     2,PFIFB
15 41034 175401           INC     3,3,SKP ;ADD ONE TO RETURN ADDRESS
16 41035 030566 GET1:     LDA     2,PFIFA
17 41036 021000           LDA     0,MASK,2
18 41037 025002           LDA     1,LO,2
19 41040 106015           ADC#    0,1,SNR ;SKIP IF BUFFER HAS CHARACTERS
20 41041 001400           JMP     0,3     ;NO CHAR. IN THE BUFFER
21 41042 125400           INC     1,1     ;SUB ONE CHARACTER FROM BUFFER
22 41043 045002           STA     1,LO,2
23 41044 175400           INC     3,3     ;ADD ONE TO RETURN ADDRESS
24 41045 021001 GET2:     LDA     0,LI,2
25 41046 107000           ADD     0,1
26 41047 021000           LDA     0,MASK,2
27 41050 106053           ADCO#   0,1,SNC
28 41051 106000           ADC     0,1     ;AC1 = BYTE NUMBER TO BE READ
29 41052 031003           LDA     2,BBUF,2
30 41053 133000           ADD     1,2     ;AC2 = BYTE ADDRESS
31                LOBE:   ;**SUBROUTINE TO LOAD BYTES INTO AC0 FROM
32                        ;BYTE ADDRESS IN AC2.
33                        ;LOSES AC2,CARRY
34                        ;REENTRANT
35 41054 151200           MOVR    2,2
36 41055 021000           LDA     0,0,2   ;GET WORD FROM BUFFER
37 41056 101013           MOV#    0,0,SNC ;TEST WHICH BYTE
38 41057 101300           MOVS    0,0     ;SWAP BYTES
39 41060 030031 MSKOT:    LDA     2,C377
40 41061 143400           AND     2,0     ;SAVE ONLY RIGHT BYTE
41 41062 024201           LDA     1,BYFLG ;GET BUFFER STATUS
42 41063 125113           MOVL#   1,1,SNC ;TEST IF BUFFER IS FULL
43 41064 001400           JMP     0,3     ;RETURN WITH CHARACTER
44 41065 014176           DSZ     BUFST   ;COUNT CHARACTERS TAKEN OUT OF BUFFER
45 41066 001400           JMP     0,3     ;RETURN WITH CHARACTER
46 41067 050201           STA     2,BYFLG ;YES SET UP STATUS TO SEND CLEAR
47 41070 001400           JMP     0,3     ;NO RETURN WITH CHARACTER
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
10028  LP201
01
02 41071 060277 TBOCD:    INTDS
03 41072 152000           ADC     2,2     ;MAKE AC2 EQUAL TO -1
04 41073 020200           LDA     0,TBFL  ;GET STATUS OF TABS
05 41074 101405           INC     0,0,SNR ;TEST TO SEE IF SECOND TAB
06 41075 157000           ADD     2,3     ;YES
07 41076 050200           STA     2,TBFL  ;SET STATUS FOR NEXT TIME
08 41077 050063           STA     2,CHRDY ;RESET CHARACTER READY
09 41100 030102           LDA     2,HSLEW ;GET STEPS LEFT IN SLEW MODE
10 41101 157000           ADD     2,3     ;
11 41102 020130           LDA     0,HSTFL ;GET HORIZONAL COMMAND
12 41103 152520           SUBZL   2,2     ;MAKE AC2 EQUAL TO 1
13 41104 175440           INCO    3,3     ;AC3 = # OF SLEW STEPS TO BE TAKEN
14 41105 054102           STA     3,HSLEW ;PREPARE TO TAKE SOME STEPS
15 41106 054166           STA     3,HTBFL ;MAKE FLAG NON ZERO TAB SLEW STEPS
16 41107 060177           INTEN
17 41110 000702           JMP     SCAN2
18
19 41111 040136 PNXTLN:   NXTLN
20 41112 040321 PSTP1:    STP1
21
22 41113 101004 OFLN2:    MOV     0,0,SZR ;SKIP IF THE HORIZONTAL MOTOR WAS NOT
23                                        ;STEPPIING AT HIGH SPEED
24 41114 000674           JMP     RTOFL+1
25 41115 152400           SUB     2,2
26 41116 020112           LDA     0,PRCHR ;GET THE CHARACTER THAT WILL BE PRINTED
27 41117 034052           LDA     3,C40   ;AC3 = 40
28 41120 116042           ADCO    0,3,SZC ;SKIP IF THE CHARACTER IS A NON
                                          ;PRINTABLE CHARACTER
29
30 41121 000666           JMP     RTOFL
31 41122 050114           STA     2,PRCNT ;DON'T PRINT IT
32 41123 024454           LDA     1,RNBLL ;GET COUNT FOR BELL
33 41124 034033           LDA     3,C7
34 41125 116405           SUB     0,3,SNR ;SKIP IF BELL NOT TO BE RUNG
35 41126 044061           STA     1,BLCNT ;SET UP BELL COUNT
36 41127 002060           JMP     @PSCAN
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
10029  LP201
01                TBCAL:  ;**COME HERE TO CALCULATE THE NUMBER OF POSITIONS
02                        ;NEEDED TO COMPLETE THE TAB
03                        ;ENTER WITH AC1 = CURRENT HORIZONTAL/VERTICAL POSITION
04                        ;AC3 POINTING TO THE STARTING OF THE TAB BUFFER IN
05                        ;PAGE 0 AND THE NEXT LOCATION HAVING A NUMBER 1 MORE
06                        ;THAN THE WORDS USED BY THE BUFFER
07                        ;THE SUBROUTINE WILL RETURN THE CONTROL TO THE CONTENTS
08                        ;OF AC3 +2
09
10 41130 054066           STA     3,RETA  ;SAVE THE RETURN ADDRESS
11 41131 102400           SUB     0,0
12 41132 030050           LDA     2,C20
13 41133 073101           DIV             ;AC0 = REMAINDER AND AC1 QUOTIENT
14 41134 112000           ADC     0,2
15 41135 050105           STA     2,TEMP4 ;SAVE THE DIFFERENCE OF REMAINDER FROM 20
16 41136 031401           LDA     2,1,3
17 41137 035400           LDA     3,0,3   ;AC3 = POINTING TO THE STARTING OF THE
18                                        ;TAB BUFFER
19 41140 137000           ADD     1,3     ;AC3 = ADDRESS OF THE LOCATION WHICH
20                                        ;HAS THE CURRENT POSITION IN IT
21 41141 132400           SUB     1,2     ;AC2 = NUMBER OF LOCATIONS LEFT IN
22                                        ;THE TAB BUFFER +1
23 41142 050103           STA     2,TEMP1
24 41143 110000           COM     0,2
25 41144 025400           LDA     1,0,3
26 41145 125220           MOVZR   1,1
27 41146 151404           INC     2,2,SZR ;SKIP AFTER MAKING BIT 15 OF AC1
28                                        ;EQUAL THE NEXT HORIZ./VERT. POSITION
29 41147 000776           JMP     .-2
30 41150 020105           LDA     0,TEMP4
31 41151 125225           MOVZR   1,1,SNR ;SKIP IF ANY TAB BIT IS SET IN
32 41152 000404           JMP     TBCL1   ;THIS WORLD
33 41153 102400           SUB     0,0
34 41154 000411           JMP     TBCL2   ;IF THIS BIT WAS SET THEN GET THE
35                                        ;DISTANCE FROM THE PRESENT POSIITION
36 41155 151400 TBCL0:    INC     2,2
37 41156 014103 TBCL1:    DSZ     TEMP1   ;SKIP IF ALL OF THE LOCATION IN THE TAB
38                                        ;BUFFER HAVE BEEN CHECKED
39 41157 175401           INC     3,3,SKP
40 41160 000412           JMP     TBCL3
41 41161 025400           LDA     1,0,3   ;READ THE NEXT LOCATION OF TAB BUFFER
42 41162 125005           MOV     1,1,SNR ;SKIP IF SOME  BIT IN AC1 IS SET
43 41163 000772           JMP     TBCL0
44 41164 000402           JMP     .+2
45 41165 101400 TBCL2:    INC     0,0
46 41166 125223           MOVZR   1,1,SNC ;SKIP IF THIS BIT WAS SET
47 41167 000776           JMP     .-2
48 41170 024050           LDA     1,C20   ;AC1 = 20
49 41171 073301           MUL
50 41172 034066 TBCL3:    LDA     3,RETA
51 41173 001402           JMP     2,3     ;RETURN AFTER LOADING AC1 WITH THE NO.
52                                        ;OF POSITIONS TO BE MOVED FOR THE TAB
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
10030  LP201
01
02 41174 131102 KEYT1:    MOVL    1,2,SZC ;SKIP IF A TAB COMMAND
03 41175 000513           JMP     TOKEY
04 41176 034124 TBRPT:    LDA     3,PSFLG ;GET THE CHARACTER POSITION FLAG
05 41177 010126 RNBLL:    ISZ     LNSIZ   ;INC. THE LINE SIZE
06 41200 020032           LDA     0,C177  ;AC0 = 177
07 41201 106037           ADCZ#   0,1,SBN ;SKIP IF THE TAB REQUIRES A MOVEMENT
08                                        ;OF MORE THAN 200 OCTAL CHARACTER
09                                        ;POSITIONS
10 41202 000533           JMP     KEYTB
11 41203 020064           LDA     0,ECLCT ;AC0 = 1 FOR REGULAR & 2 FOR ELONGATED
12                                        ;CHARACTERS BEING SAVED
13 41204 117000           ADD     0,3     ;AC3 = NEW HORIZONTAL POSITION
14 41205 054124           STA     3,PSFLG
15 41206 106400           SUB     0,1     ;AC1 = NUMBER OF CHARACTER POSITION LEFT
16                                        ;TO COMPLETE A HORIZONTAL TAB
17 41207 044103           STA     1,TEMP1
18 41210 020052           LDA     0,C40
19 41211 006403           JSR     @PPUT1  ;SAVE A SPACE
20 41212 024103           LDA     1,TEMP1
21 41213 000763           JMP     TBRPT
22 41214 041424 PPUT1:    PUT1
23
24
25                KYBRD:  ;**SUBROUTINE TO ACCEPT A KEY FROM THE KEYBOARD
26                        ;AND STORE IN THE FIFOA
27
28                        IN      0,5     ;READ THE KEY
29 41215 022015             LDA   0,@.PIN+5
30 41216 034032           LDA     3,C177
31 41217 163400           AND     3,0     ;STRIPT THE PARITY BIT
32 41220 034066           LDA     3,RETA
33 41221 054067           STA     3,RETS  ;SAVE "RETA"
34 41222 006405           JSR     @PPPUT
35 41223 000025 PFIFA:    FIFOA           ;PUT IT IN FIFOA
36 41224 034067           LDA     3,RETS
37 41225 054066           STA     3,RETA  ;RESTOR "RETA"
38 41226 002054           JMP     @PRSTR  ;RETURN
39 41227 041422 PPPUT:    PUT
40 41230 041555 PESC:     ESCSV
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
!0031  LP201
01                ROTTO:  ;A CHARACTER HAS COME IN THE TTO LINE.
02 41231 062401           SAV
03                        IN      0,2     ;LOAD CHARACTER IN AC0
04 41232 022012             LDA   0,@.PIN+2
05 41233 105000 STDE:     MOV     0,1     ;SAVE THE CHARACTER TO BE PRINTED
06 41234 152400           SUB     2,2     ;CLEAR AC2
07 41235 050157           STA     2,DSRFL ;RESTART TIMER FOR DISCONNECT
08 41236 030031           LDA     2,C377
09 41237 155400           INC     2,3     ;AC3 = 400
10 41240 117405           AND     0,3,SNR ;SKIP IF NO PARITY ERROR
11 41241 020031           LDA     0,C377  ;ERROR CHARACTER RUBOUT
12 41242 143400           AND     2,0     ;MASK OUT THE LEFT BYTE
13 41243 034132           LDA     3,DLLF  ;GET THE DOWN LINE LOAD FLAG
14 41244 175014           MOV#    3,3,SZR ;SKIP IF IT IS NOT DOWN LINE
15                                        ;LOAD
16 41245 005400           JSR     0,3     ;GO TO DOWN LINE LOAD ROUTINE
17 41246 155220           MOVZR   2,3     ;AC3 = 177
18 41247 030151           LDA     2,ESFLG ;READ THE FLAG INDICATING THE
19                                        ;SAVING OF AN ESCAPE COMMAND
20 41250 151234           MOVZR#  2,2,SZR ;SKIP IF NOT AN ESCAPE COMMAND
21 41251 002757           JMP     @PESC
22 41252 163400           AND     3,0     ;ONLY INTERESTED IN BITS 9-15
23 41253 137400           AND     1,3     ;MASK OUT BITS 0-8 OF THE CHARACTER
24                                        ;ORIGINALLY RECEIVED
25 41254 030051           LDA     2,C33
26 41255 112415           SUB#    0,2,SNR ;SKIP IF NOT STARTING OF AN ESCAPE
27                                        ;COMMAND
28 41256 000540           JMP     IS33
29 41257 030142           LDA     2,PLTFL ;AC2 = 0 IF PLOTTING MODE NOT TO
30                                        ;BE SELECTED FOR THIS LINE
31 41260 151004           MOV     2,2,SZR ;SKIP IF NOT UNDER PLOTTING MODE
32 41261 000457           JMP     KEYT4   ;SAVE EVERY CHAR FOR PLOT MODE
33 41262 024025           LDA     1,C17   ;AC1=17
34 41263 106645           SUBOR   0,1,SNR ;SKIP IF NOT AN ALT. CHAR. COMMAND
35 41264 000527           JMP     ESC3    ;SAVE IT
36 41265 024034           LDA     1,C10   ;AC1 = 10
37 41266 030036           LDA     2,C13   ;AC2 = 13
38 41267 112654           SUBOR#  0,2,SZR ;SKIP FOR A NEW LINE OR VERTICAL TAB
39 41270 030037           LDA     2,C15
40 41271 106405           SUB     0,1,SNR ;SKIP IF A BACK SPACE
41 41272 141000           MOV     2,0     ;A BACK SPACE WILL BE REPLACED BY
42                                        ;A RETURN
43 41273 112655           SUBOR#  0,2,SNR ;SKIP IF NOT A "NEW LINE", "RETURN"
44                                        ;OR FORM FEED
45 41274 000446           JMP     LNEND
46 41275 124014           COM#    1,1,SZR ;SKIP IF IT WAS A HORIZ TAB
47 41276 000410           JMP     KEYT0
48 41277 024124           LDA     1,PSFLG ;AC1 = POSITION FLAG
49 41300 004630           JSR     TBCAL   ;CALCULATE THE NUMBER OF HORIZ POS.
50                                        ;TO BE MOVED FOR THE TAB
51 41301 000211           HTAB
52 41302 000012           12
53 41303 125005           MOV     1,1,SNR ;SKIP IF SOME MOVEMENT IS DESIRED
54 41304 002054           JMP     @PRSTR  ;RETURN WITHOUT SAVING
55 41305 020052           LDA     0,C40
56 41306 030135 KEYT0:    LDA     2,DLLSL ;SEE IF DOWN LINE LOADED CHARACTER IS
57                                        ;BEING SAVED
58 41307 151004           MOV     2,2,SZR ;SKIP IF NOT SAVING DOWN LINE LOADED
59                                        ;CHARACTERS
60 41310 000477 TOKEY:    JMP     KEYT3
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
 0032  LP201
01 41311 030032           LDA     2,C177  ;AC2 = 177
02 41312 112415           SUB#    0,2,SNR ;SKIP IF THE CHARACTER RECEIVED WAS A
03 41313 002054           JMP     @PRSTR  ;RUBOUT RETURN WITHOUT SAVING
04 41314 030052           LDA     2,C40   ;AC2 = 40
05 41315 112053           ADCO#   0,2,SNC ;SKIP IF THE CHARACTER IS NOT A CONTROL
06                                        ;CHARACTER
07 41316 000463           JMP     TBELL
08 41317 112414           SUB#    0,2,SZR ;SKIP IF A SPACE
09 41320 000466           JMP     KEYT2
10 41321 034062           LDA     3,LINES
11 41322 030123           LDA     2,LDSPC ;GET THE FLAG FOR LEADING SPACES
12 41323 175414           INC#    3,3,SZR ;SKIP IF THIS IS THE FIRST LINE BEING
13                                        ;SAVED
14 41324 112415           SUB#    0,2,SNR ;SKIP IF LEADING SPACES ARE
15                                        ;BEING COLLECTED
16 41325 000647           JMP     KEYT1
17 41326 125112           MOVL#   1,1,SZC ;SKIP IF A LEADING TAB COMMAND
18 41327 024064           LDA     1,ECLCT ;"ECLCT" IS 1 FOR REGULAR & 2 FOR
19                                        ;ELONGATED CHARACTERS SAVED IN THE
20                                        ;PRINT BUFFER
21 41330 020124           LDA     0,PSFLG
22 41331 123000           ADD     1,0
23 41332 040124           STA     0,PSFLG ;SAVE THE NEW HORIZONTAL POSITION OF
24                                        ;THE LINE BEING SAVED
25 41333 004504           JSR     STOB    ;SAVE THE NUMMBER OF LEADING SPACES
26 41334 000465           JMP     CLRBSY
27
28
29 41335 123000 KEYTB:    ADD     1,0
30 41336 137000           ADD     1,3
31 41337 054124           STA     3,PSFLG ;SAVE THE NEW POSITION FLAG
32 41340 004464 KEYT4:    JSR     PUT1    ;PLACE THE CHARACTER IN FIFO8
33 41341 000460           JMP     CLRBSY
34
35 41342 044103 LNEND:    STA     1,TEMP1 ;SAVE THE LINE TERMINATOR
36 41343 004461           JSR     PUT1    ;STORE THE LINE TERMINATOR
37 41344 010062           ISZ     LINES   ;INCREMENT THE COUNTER FOR THE
38                                        ;NUMBER OF LINES IN THE BUFFER
39                                        ;SKIP IF THIS WAS END OF THE
40                                        ;VERY FIRST LINE
41 41345 000402           JMP     .+2
42 41346 000407           JMP     STFL1
43 41347 030156           LDA     2,CHADR ;AC2 = BYTE ADDRESS WHERE THE SIZE
44                                        ;OF THE LINE WILL BE STORED
45 41350 020126           LDA     0,LNSIZ ;AC0 = NUMBER OF CHAR. IN
46                                        ;THE LINE
47 41351 004466           JSR     STOB
48 41352 030155           LDA     2,PSADR ;GET THE BYTE ADDRESS WHERE THE LINE
49                                        ;SIZE INFORMATION IS TO BE SAVED
50 41353 020124           LDA     0,PSFLG ;GET THE LINE SIZE
51 41354 004463           JSR     STOB    ;SAVE IT
52 41355 020124 STFL1:    LDA     0,PSFLG ;AC0 = POSITION OF THE LAST CHARACTER IN
53                                        ;THE LINE
54 41356 024103           LDA     1,TEMP1 ;GET THE LINE TERMINATOR
55 41357 034064           LDA     3,ECLCT ;AC3 = 1 FOR REGULAR & 2 FOR ELONGATED
56                                        ;CHARACTERS BEING SAVED
57 41360 125005           MOV     1,1,SNR ;SKIP IF IT WAS NOT BACK SPACE
58 41361 101005           MOV     0,0,SNR ;SKIP IF THERE ARE SOME SPACES OR
59                                        ;CHARACTERS IN THE LINE
60 41362 102401           SUB     0,0,SKP
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
 0033  LP201
01 41363 162400          SUB     3,0      ;DECREMENT BY 1 FOR REGULAR & 2
02                                        ;FOR ELONGATED
03 41364 040124          STA     0,PSFLG
04 41365 004437          JSR     PUT1     ;SAVE THE NUMBER OF LEADING SPACES FOR
05                                        ;THE NEXT LINE
06 41366 050123          STA     2,LDSPC  ;"LDSPC" HAS THE BYTE ADDRESS WHERE THE
07                                        ;NO. OF LEADING SPACES WILL BE COLLECTED
08 41367 102400          SUB     0,0
09 41370 040153          STA     0,ESCMD  ;CLEAR THE FLAG COLLECTING ESCAPE COMNDS.
10 41371 040126          STA     0,LNSIZ  ;RESET THE LINE SIZE COUNTER
11 41372 004432          JSR     PUT1     ;INIT THE ESCAPE COMMAND FLAG
12 41373 050154          STA     2,ECMND  ;"ECMND" HAS THE ADDRESS OF THE BYTE
13                                        ;WHERE ESCAPE COMMAND FLAG WILL BE SET
14 41374 004430          JSR     PUT1     ;INIT THE LINE SIZE FLAG
15 41375 050155          STA     2,PSADR  ;"PSADR" HAS THE BYTE ADDRESS WHERE THE
16                                        ;SIZE OF THE LINE WILL BE SAVED
17 41376 004426          JSR     PUT1     ;INIT THE COUNTER FOR THE NUMBER OF
18                                        ;PRINTABLE CHARACTERS IN THE LINE
19 41377 050156          STA     2,CHADR  ;"CHADR" HAS THE BYTE ADDRESS WHERE THE
20                                        ;NUMBER OF CHARACTERS IN THE LINE WILL
21                                        ;BE SAVED
22 41400 000421          JMP     CLRBSY
23
24 41401 030407 TBELL:   LDA     2,RNBL1  ;GET BELL COUNT
25 41402 034033          LDA     3,C7     ;GET BELL CODE IN AC3
26 41403 116405          SUB     0,3,SNR  ;TEST FOR BELL & SKIP IF IT IS BELL
27 41404 050061          STA     2,BLCNT  ;RING THE BELL
28 41405 002054          JMP     @PRSTR   ;RETURN WITHOUT SAVING
29 41406 050123 KEYT2:   STA     2,LDSPC  ;DON'T COLLLECT LEADING SPACES ANY MORE
30 41407 034124 KEYT3:   LDA     3,PSFLG  ;GET THE CHARACTER POSITION IN THE LINE
31 41410 010126 RNBL1:   ISZ     LNSIZ    ;ANY CHARACTER THAT GOT SAVED IN THE
32                                        ;BUFFER WILL INCREASE THE LINE SIZE
33 41411 024064          LDA     1,ECLCT  ;AC1 = 1 FOR REGULAR AND 2 IF ELONGATED
34                                        ;CHARACTER IS BEING SAVED
35 41412 000724          JMP     KEYTB+1
36
37 41413 125520 ESC3:    INCZL   1,1      ;AC1=2
38 41414 040140          STA     0,CMNDS  ;SAVE THE COMMAND RECEIVED
39 41415 000463          JMP     ESCP3
40              IS33:    IN      1,3
41 41416 026013            LDA   1,@.PIN+3
42 41417 127102          ADDL    1,1,SZC  ;SKIP IF ESC SWITCH IS SET
43 41420 040151          STA     0,ESFLG
44 41421 002054 CLRBSY:  JMP     @PRSTR
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
10034  LP201
01               PUT:    ;**SUBROUTINE TO PUT CHARACTER FROM AC0 INTO FIFO
02                       ;JSR IS FOLLOWED BY POINTER TO FIFO CONTROL BLOCK
03                       ;SEE GET FOR FIFO PICTURE
04                       ;LOSES AC0, AC1,AC2,CARRY
05 41422 031400          LDA     2,0,3    ;AC2 = ADD. OF THE FIFO
06 41423 175401          INC     3,3,SKP
07 41424 030050 PUT1:    LDA     2,PFIFB  ;ENTER HERE ONLY IF THE BYTE
08                                        ;HAS TO BE PLACED IN FIFOB
09 41425 054066          STA     3,RETA   ;SAVE THE RETURN ADDRESS
10 41426 015002          DSZ     L0,2
11 41427 000401          JMP     .+1
12 41430 025001          LDA     1,LI,2
13 41431 035000          LDA     3,MASK,2
14 41432 136404          SUB     1,3,SZR  ;SKIP IF AC1 HAD BECOME EQUAL TO
15                                        ;THE MAXIMUM SIZE OF THE BUFFER
16 41433 135400          INC     1,3
17 41434 055001          STA     3,LI,2
18 41435 031003          LDA     2,BBUF,2
19 41436 173001          ADD     3,2,SKP  ;AC2 = BYTE ADDRESS
20               STOB:   ;**SUBROUTINE STORE BYTE
21                       ;AC0 HAS CHAR ON RIGHT PLUS GARBAGE
22                       ;AC2 HAS BYTE ADDRESS
23                       ;LOSES AC1
24                       ;REENTRANT
25 41437 054066          STA     3,RETA
26 41440 034031          LDA     3,C377
27 41441 151202          MOVR    2,2,SZC
28 41442 163401          AND     3,0,SKP  ;RIGHT HALF OF THE WORD IS
29                                        ;ADDRESSED BY ODD BYTE ADDRESS
30 41443 163701          ANDS    3,0,SKP  ;AND THE LEFT HALF BY THE
31                                        ;EVEN BYTE ADDRESS
32 41444 174000          COM     3,3
33 41445 025000          LDA     1,0,2
34 41446 167400          AND     3,1
35 41447 107000          ADD     0,1
36 41450 045000          STA     1,0,2
37 41451 151100          MOVL    2,2
38 41452 002066          JMP     @RETA
39
40 41453 000131 C131:    131
41 41454 000105 C105:    105
```

```
01 41455 054066 ESCHK:  STA     3,RETA  ;SAVE THE RETURN ADDRESS
02 41456 034124         LDA     3,PSFLG ;AC3 = CURRENT POSITION OF THIS LINE
                                        ;IF IT WAS BEING PRINTED
03
04 41457 175004         MOV     3,3,SZR ;SKIP IF STARTING OF THE LINE
05 41460 002474         JMP     @PCLRB
06 41461 034052         LDA     3,C40   ;AC3 = 40
07 41462 054123         STA     3,LDSPC ;PREPARE NOT TO SAVE LEADING SPACES FOR
                                        ;THIS LINE
09 41463 002066         JMP     @RETA   ;RETURN
10
11
12 41464 102400 NUMOR:  SUB     0,0
13 41465 010105         ISZ     SVEX    ;SKIP IF SAVING THE COMMAND
14 41466 000566         JMP     TRIDC   ;RETURN TO SCAN
15 41467 040151         STA     0,ESFLG
16 41470 002464         JMP     @PCLRB  ;RETURN TO CLRBSY
17
18 41471 040151 ESCP1:  STA     0,ESFLG
19 41472 004763         JSR     ESCHK   ;FOR THESE COMMANDS TO BE ACCEPTED
20 41473 040151 ESCP2:  STA     0,ESFLG ;THE PRINTER SHOULD BE AT THE STARTING
21 41474 044105         STA     1,SVEX  ;OF A LINE
22 41475 020051         LDA     0,C33   ;AC0 = 33
23 41476 004726         JSR     PUT1    ;SAVE THE ESCAPE CODE
24 41477 024105         LDA     1,SVEX
25 41500 020153 ESCP3:  LDA     0,ESCMD
26 41501 107415         AND#    0,1,SNR ;SKIP IF THIS BIT OF THE ESCAPE
                                        ;COMMAND FLAG WAS ALREADY SET
27
28 41502 123000         ADD     1,0
29 41503 040153         STA     0,ESCMD
30 41504 034062         LDA     3,LINES
31 41505 030154         LDA     2,ECMND ;AC2 = BYTE ADDRESS WHERE THE THE ESC.
                                        ;COMMAND FLAG WILL BE SET
33 41506 175404         INC     3,3,SZR ;SKIP IF THIS IS THE FIRST LINE BEING
                                        ;ASSEMBLED
35 41507 004730         JSR     STOB    ;SAVE THE BYTE AT ADD. IN AC2
36 41510 020140         LDA     0,CMNDS ;GET THE COMMAND WORD
37 41511 000627         JMP     KEYT4
38
39
40 41512 125404 ARGMNT: INC     1,1,SZR ;SKIP IF ARGUMENT IS BEING SAVED
41 41513 000416         JMP     ARGEX   ;ARGUMENT BEING EXECUTED
42 41514 145440         INCO    2,1     ;IF AC2=-1 THEN 0 OUT THE CARRY
43 41515 125416         INC#    1,1,SEZ ;SKIP IF AC2 WAS A -2 OR -1
44 41516 105005         MOV     0,1,SNR ;SKIP IF THE COMMAND IS TO BE TERMINATED
                                        ;BY A BYTE OF 0 AND IT IS NOT A 0 BYTE
46 41517 044151         STA     1,ESFLG
47 41520 030140         LDA     2,CMNDS ;GET THE COMMAND FOR WHICH THIS IS
                                        ;THE ARGUMENT
49 41521 034732         LDA     3,C131  ;AC3=131
50 41522 172014         ADC#    3,2,SZR ;SKIP IF IT WAS A COMMAND TO START
                                        ;EXECUTING DOWN LINE LOAD PROGRAM
52 41523 034731         LDA     3,C105  ;AC3=105
53 41524 172005         ADC     3,2,SNR ;SKIP IF NOT A VERTICAL TAB COMMAND
                                        ;(I.E. F OR 106)
55 41525 004730         JSR     ESCHK   ;FOR THESE COMMANDS A LINE TERMINATOR
                                        ;SHOULD HAVE BEEN RECEIVED
57 41526 151414         INC#    2,2,SZR ;SKIP IF COMMAND IS TO SET HORIZONTAL
                                        ;TAB (I.E. E OR 105
59 41527 000611         JMP     KEYT4
60 41530 000567         JMP     HRTAB+3 ;TO SET THE HORIZONTAL TAB AC1 SHOULD
```

PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
COPYRIGHT DGC, 1979


```
01                              ;HAVE THE HORIZONTAL POSITION AND AC2
02                              ;SHOULD BE -1
03
04              ARGEX:  ;**COME HERE WHEN ESCAPE COMMANDS EXEC. ARE FOLLOWED BY
05                      ;ARGUMENTS
06 41531 150224         COMZR   2,2,SZR ;SKIP IF THE ARGUMENTS ARE ONLY TWO
07                                      ;BYTES LONG
08 41532 000553         JMP     ESAR1
09 41533 030162         LDA     2,ARGFL ;GET THE LAST ARGUMENT BYTE
10 41534 040162         STA     0,ARGFL ;SAVE THE PRESENT ARGUMENT BYTE
11 41535 010152         ISZ     ESFL1   ;SKIP AFTER RECEIVING BOTH THE BYTES
12 41536 002060         JMP     @PSCAN
13 41537 151300         MOVS    2,2
14 41540 113000         ADD     0,2     ;AC2 = ARGUMENT WORD
15 41541 034141         LDA     3,CMNDE ;GET THE COMMAND WHICH WAS FOLLOWED BY
16                                      ;THIS ARGUMENT
17 41542 020464         LDA     0,C117  ;AC0 = 117
18 41543 162005         ADC     3,0,SNR ;SKIP IF IT WAS NOT A COMMAND TO
19                                      ;SELECT DOWN LINE LOADED CHARACTERS
20 41544 000507         JMP     DLCHR   ;AC2=ADDRESS OF DLL CHAR SET
21 41545 034130         LDA     3,HSTFL
22 41546 175004         MOV     3,3,SZR ;;WAIT FOR THE STEPPER MOTOR TO STOP
23 41547 000776         JMP     .-2
24 41550 034073         LDA     3,VSLEW
25 41551 175004         MOV     3,3,SZR ;WAIT FOR THE VERTICAL STEPS TO COMPLETE
26 41552 000776         JMP     .-2
27 41553 001000         JMP     0,2     ;GO TO THE ADDRESS WHERE THE DOWN LINE
                                        ;LOADED PROGRAM STARTS
28
```

```
01 41554 041421 PCLRB:  CLRBSY
02 41555 126021 ESCSV:  ADCZ    1,1,SKP ;ENTER HERE IF SAVING COMMAND
03 41556 126440 ESCEX:  SUBO    1,1,    ;ENTER HERE IF EXECUTING COMMAND
04                                       ;SETS CARRY TO 0, AC1 TO 0
05 41557 151112         MOVL#   2,2,SZC ;IF BIT 0 OF AC2 IS SET, THEN
06                                       ;THE DATA IS AN ARGUMENT
07 41560 000732         JMP     ARGMNT  ;BIT 0 SET
08 41561 044105         STA     1,SVEX  ;"SVEX" WILL BE -1 FOR SAVE & 0 FOR
09                                       ;EXECUTE
10 41562 125425         INCZ    1,1,SNR ;SKIP IF COMMAND IS BEING EXECUTED
11 41563 040140         STA     0,CMNDS ;COMMAND IS BEING SAVED
12 41564 176003         ADC     3,3,SNC ;AC3=-1, SKIP IF COMMAND BEING SAVED
13 41565 040141         STA     0,CMNDE ;COMMAND BEING EXECUTED
14 41566 175620 ESCLP:  INCZR   3,3     ;AC3 WILL BE INCREMENTED EVERY
15                                       ;TIME A NEW CONSTANT IS COMPARED
16                                       ;TO THE DATA WORD IF THE CARRY = 0,
17                                       ;(AC3 IS EVEN) THEN WE ARE CHECKING
18                                       ;THE LOW BYTE OF THE CONSTANT
19 41567 030431         LDA     2,CMADR ;GET BASE ADDRESS
20 41570 173003         ADD     3,2,SNC ;ADD DISPLACEMENT TO BASE
21                                       ;SKIP IF CARRY IS NOT EQUAL 0
22                                       ;(AC3 ODD) AND DON'T FETCH ANOTHER
23                                       ;CONSTANT WORD, ELSE FETCH NEW
24                                       ;CONSTANT WORD
25 41571 025360         LDA     1,(CMADR-BASE)+1,2      ;FETCH NEW CONSTANT WORD
26                                       ;BY USING DISPLACEMENT FROM BASE
27 41572 125300         MOVS    1,1     ;SWAP OLD CONSTANT WORD TO
28                                       ;TEST NEW BYTE
29 41573 175100         MOVL    3,3     ;RESTORE AC3 TO ORIGINAL DISPLACEMENT
30                                       ;VALUE.
31 41574 030032         LDA     2,C177  ;GET MASK
32 41575 143400         AND     2,0     ;MASK OUT THE PARITY BIT
33 41576 133405         AND     1,2,SNR ;MASK, SKIP IF VALID CONSTANT
34 41577 000665         JMP     NUMOR   ;END OF LIST, INVALID COMMAND
35 41600 142654         SUBOR#  2,0,SZR ;SKIP ONLY IF THE COMMAND
36                                       ;EQUALS THE BYTE UNDER TEST
37                                       ;OR THE BYTE UNDER TEST+1, CARRY
38                                       ;WILL BE 0 FOR THE FIRST CASE,
39                                       ;1 FOR THE SECOND
40 41601 000765         JMP     ESCLP   ;NO MATCH, TRY NEXT CONSTANT
41 41602 024416         LDA     1,CMADR ;GET BASE ADDRESS
42 41603 137000         ADD     1,3     ;ADD OFFSET TO IT AC3 IS
43                                       ;NUMBER OF BYTES TESTED WHEN
44                                       ;MATCH OCCURRED
45 41604 025766         LDA     1,DIS0,3        ;LOAD TENTATIVE ADDRESS WORD
46                                       ;FROM SAVE TABLE
47 41605 010105         ISZ     SVEX    ;SKIP IF SAVING, DON'T SKIP IF
48                                       ;EXECUTING
49 41606 025400         LDA     1,DIS1,3        ;EXECUTING, LOAD FROM EXECUTION TABLE
50 41607 112404         SUB     0,2,SZR ;SKIP IF COMMAND WAS EXACT MATCH,
51                                       ;AC2=-1 IF NOT EXACT MATCH
52 41610 125300         MOVS    1,1     ;COMMAND WAS ACTUALLY ONE HIGHER
53                                       ;SO SWAP BYTES FOR CORRECT ADDRESS
54 41611 150000         COM     2,2     ;AC2 = -1 FOR EXACT MATCH AND 0 IF NOT
55 41612 020031         LDA     0,C377  ;GET MASK
56 41613 123400         AND     1,0     ;MASK OFF HIGH BYTE
57 41614 117000         ADD     0,3     ;ADD DISPLACEMENT TO ADDRESS
58 41615 102400         SUB     0,0     ;CLEAR AC0 FOR USE IN ROUTINES
59 41616 126520         SUBZL   1,1     ;SET AC1 TO 1 FOR USE IN ROUTINES
60 41617 001400         JMP     0,3     ;JUMP TO CORRECT ROUTINE
```

PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
COPYRIGHT DGC, 1979


```
01                                       ;AC2=0 FOR EXACT MATCH
02                                       ;-1 IF COMMAND WAS ACTUALLY 1
03                                       ;MORE THAN CONSTANT BYTE
04 41620 041641 CMADR:  BASE
05
06 41621 030465         61*400+65
07 41622 036076         74*400+76
08 41623 042516         105*400+116
09 41624 054541         131*400+141
10 41625 062143         144*400+143
11 41626 000117 C117:   117             ;LEFT BYTE OF THIS WORD SHOULD BE 0 TO
12                                       ;INDICATE THE END OF COMMANDS
13
14 41627 025453 SVTBL:  (HRTAB-.+DIS0)*400+HRTAB-.+DIS0
15 41630 006415         (TESP2-.+DIS0)*400+TESP2-.+DIS0
16 41631 005412         (ELNDS-.+DIS0)*400+ELNSL-.+DIS0
17 41632 007016         (TESP1-.+DIS0)*400+TESP1-.+DIS0
18 41633 006020         (FCMND-.+DIS0)*400+ECMD-.+DIS0
19 41634 065552         (OCMND-.+DIS0)*400+NCMND-.+DIS0
20 41635 004554         (ZCMND-.+DIS0)*400+PRDLL-.+DIS0
21 41636 003407         (TESP2-.+DIS0)*400+TESP2-.+DIS0
22 41637 005012         (PLMOD-.+DIS0)*400+PLMOD-.+DIS0
23 41640 023405         (TOCLR-.+DIS0)*400+TESP2-.+DIS0
24
25              BASE:
26 41641 060541 EXTBL:  (HRZTB-.+DIS1)*400+HRZTB-.+DIS1
27 41642 062545         (VRTAB-.+DIS1)*400+VRTAB-.+DIS1
28 41643 054531         (ELONG-.+DIS1)*400+ELONG-.+DIS1
29 41644 042104         (CMPRS-.+DIS1)*400+CMPRS-.+DIS1
30 41645 014534         (VRCMD-.+DIS1)*400+TSCAN-.+DIS1
31 41646 002530         (DLCHR-.+DIS1)*400+PRARG-.+DIS1
32 41647 053532         (PRARG-.+DIS1)*400+TSCAN-.+DIS1
33 41650 053527         (SCORE-.+DIS1)*400+SCORE-.+DIS1
34 41651 045513         (PLOT-.+DIS1)*400+PLOT-.+DIS1
35 41652 053514         (TSCAN-.+DIS1)*400+MRST-.+DIS1
36
37 41653 050137 DLCHR:  STA     2,DLFLG ;SET/RESET FLAG TO SELECT DOWN LINE
38                                       ;LOADED CHARACTER SET
39 41654 000524 TRTDC:  JMP     RTDCD
40
41 41655 125120 ELNSL:  MOVZL   1,1     ;AC1 = 2
42 41656 044064 ELNDS:  STA     1,ECLCT ;SET ECLCT TO 1 IF SELECTING
43                                       ;ELONGATED, 2 IF DESELECTING
44 41657 000614 TESP2:  JMP     ESCP2   ;GO TO ESCP2
45
46 41660 102121 ZCMND:  ADCZL   0,0,SKP ;AC0=-2
47 41661 102620 FCMND:  SUBZR   0,0     ;AC0=100000
48 41662 000607 TESP1:  JMP     ESCP1   ;
49
50 41663 050142 PLMOD:  STA     2,PLTFL ;SET PLTFL TO 0 IF IT HAS TO BE
51                                       ;DISABLED AND -1 IF ENABLED
52 41664 000776         JMP     TESP1
53       177766 DIS0 = SVTBL-BASE       ;DEFINE SAVE TABLE DISPLACEMENT CONSTANT
54       000000 DIS1 = EXTBL-BASE       ;DEFINE EXECUTE TABLE DISPLACEMENT
55                                       ;CONSTANT
56
57 41665 126620 ECMD:   SUBZR   1,1
58 41666 044151         STA     1,ESFLG ;DEPOSIT A 100000 IN "ESFLG"
59 41667 034433 CLRTB:  LDA     3,PHTAB
60 41670 024035         LDA     1,C12   ;AC1 = 12
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
 0039  LP201
01 41671 106005          ADC     0,1,SNR
02 41672 002662          JMP     @PCLRB  ;RETURN AFTER CLEARING ALL OF THE
03                                       ;HORIZONTAL TAB BUFFER
04 41673 041400          STA     0,0,3
05 41674 175400          INC     3,3
06 41675 000774          JMP     .-4
07
08 41676 034415 VRCMD:   LDA     3,PVTAB ;AC3 = POINTER TO VERTICAL TAB BUFFER.
09 41677 030033          LDA     2,C7    ;AC2=7
10 41700 041400          STA     0,0,3   ;CLEAR
11 41701 175400          INC     3,3
12 41702 112044          ADCO    0,2,SZR ;DECREMENT & SKIP WHEN OVER
13 41703 000775          JMP     .-3
14 41704 102621          SUBZR   0,0,SKP ;PREPARE TO RECEIVE OTHER ARGUMENTS BY
15                                       ;DEPOSITING A 100000 IN "ESFL1"
16 41705 105005 ESAR1:   MOV     0,1,SNR ;SKIP IF THE BYTE RECEIVED IS NOT 0
17 41706 000472          JMP     RTDCD
18 41707 125400 VRTBB:   INC     1,1     ;ADD 1 TO TAB SET
19 41710 020125          LDA     0,LNCNT ;AC0 = NUMBER OF LINES IN THE FORMS
20 41711 006412          JSR     @ITAB   ;GO TO JSR TAB STATEMENT
21 41712 002060          JMP     @PSCAN
22 41713 000202 PVTAB:   VTAB
23
24 41714 040151 HRTAB:   STA     0,ESFLG ;0 OUT THE "ESFLG" TO INDICATE THE END
25                                       ;OF ESCAPE COMMAND SEQUENCE
26 41715 024124          LDA     1,PSFLG ;GET THE FLAG FOR THE CURRENT POSITION
27 41716 125400          INC     1,1
28 41717 020007          LDA     0,D132  ;AC0 = 132.
29 41720 004547          JSR     TAB
30 41721 002633 TOCLR:   JMP     @PCLRB
31 41722 000211 PHTAB:   HTAB
32 41723 042067 ITAB:    TAB
33
34
35               ALTNT:  ;ENTER WITH THE CARRY A 0 TO SELECT THE ALTERNATE
36                       ;MODE AND 1 TO DESELECT IT
37 41724 024122          LDA     1,ALTMD ;AC1 = -1 IF THE ALTERNATE MODE JUMPER
38                                       ;IS IN 0 OTHERWISE
39 41725 102460          SUBC    0,0     ;AC0 = 0 & CARRY UNCHANGED
40 41726 125404          INC     1,1,SZR ;SKIP IF THE JUMPER IS IN AFTER
41                                       ;COMPLEMENTING THE CARRY
42 41727 000451          JMP     RTDCD
43 41730 034033          LDA     3,C7    ;AC3  = 7
44 41731 060277 STOT3:   INTDS
45 41732 030134          LDA     2,OT3FL ;READ THE LAST OUT3 COMMAND THAT WAS
46                                       ;ISSUED
47 41733 173402          AND     3,2,SZC ;MASK OUT THE APPROPRIATE BIT & SKIP
48                                       ;IF THE MODE HAS TO BE DESELECTED
49 41734 172000          ADC     3,2
50 41735 034032          LDA     3,C177  ;AC3 = 177
51 41736 157400          AND     2,3
52 41737 054134          STA     3,OT3FL
53                       OUT     3,3,2
54 41740 030043            LDA   2,.POUT+3
55 41741 173000            ADD   3,2
56 41742 041000            STA   0,0,2
57 41743 034046          LDA     3,.POUT+6
58 41744 137000          ADD     1,3     ;IF PRINT MODE WAS CHANGED FROM REGULAR
59                                       ;TO COMPRESS OR VICE VERSA THEN CLEAR
60                                       ;PRINT AND START CHARACTER INTERRUUPTS
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
 0040  LP201
01 41745 041400          STA     0,0,3
02 41746 060177          INTEN
03 41747 000431          JMP     RTDCD
04 41750 024121 CMPRS:   LDA     1,CMPMD ;AC1 =-1 IF JUMPER IS IN
05 41751 125404          INC     1,1,SZR ;SKIP IF JUMPER IS IN
06 41752 000426          JMP     RTDCD   ;JUMPER NOT IN RETURN
07 41753 034117          LDA     3,PRTYP ;GET THE FLAG FOR PRINT TYPE
08 41754 175200          MOVR    3,3
09 41755 151200          MOVR    2,2     ;LOAD CARRY WITH 1 IF COMPRESS MODE
10                                       ;HAS TO BE SELECTED & 0 IF NOT
11 41756 175100          MOVL    3,3
12 41757 054117          STA     3,PRTYP
13 41760 034037          LDA     3,C15
14 41761 125540          INCOL   1,1     ;AC1 = 3
15 41762 151200          MOVR    2,2     ;CARRY=1 IF COMPRESS MODE HAS
16                                       ;TO BE SELECTED & 0 IF NOT
17 41763 000746          JMP     STOT3
18 41764 050144 PLOT:    STA     2,PLTSL ;"PLTSL" WILL BE 0 IF THE PLOTTING
19                                       ;MODE HAS TO BE DESELECTED AND -1
20                                       ;IF IT HAS TO BE SELECTED
21 41765 000413          JMP     RTDCD
22 41766 152400 MRST:    SUB     2,2     ;CLEAR AC2
23 41767 176540          SUBOL   3,3     ;MAKE AC3 = 1
24 41770 054064          STA     3,ECLCT
25 41771 126000          ADC     1,1     ;MAKE AC1 = -1
26 41772 002401          JMP     @MRST1
27 41773 040031 MRST1:   MRST2
28 41774 050161 ELONG:   STA     2,ELNEN ;"ELNEN" WILL BE 0 IF ELONGATED MODE HAS
29                                       ;TO BE DISABLED AND -1 OTHERWISE
30 41775 000403          JMP     RTDCD
31
32 41776 102121 PRARG:   ADCZL   0,0,SKP ;PREPARE TO RECEIVE 2 BYTES OF ARGUMENT
33                                       ;BY DEPOSITING A -2 IN "ESFL1"
34 41777 050146 SCORE:   STA     2,SCRFL ;"SCRFL" WILL BE 0 IF UNDER SCORE
35                                       ;HAS TO BE DISABLED AND -1 TO ENABLE
36 42000 040152 RTDCD:   STA     0,ESFL1 ;END OF ESCAPE COMMAND SEQUENCE
37 42001 002060 TSCAN:   JMP     @PSCAN
38
39 42002 024101 HRZTB:   LDA     1,HPOS  ;GET THE HORIZONTAL POSITION OF THE HEAD
40 42003 020007          LDA     0,D132  ;AC0 = 132.
41 42004 004463          JSR     TAB
42 42005 002060          JMP     @PSCAN
43 42006 000211 IHTAB:   HTAB
44 42007 040152 VRTAB:   STA     0,ESFL1 ;CLEAR THE ESCAPE FLAG
45 42010 024074          LDA     1,VPOS  ;GET THE CURRENT VERTICAL POSITION
46 42011 034073          LDA     3,VSLEW ;GET THE NUMBER OF VERTICAL STEPS LEFT
47                                       ;TO BE TAKEN
48 42012 167000          ADD     3,1     ;VERTICAL POSITION WHERE TAB WILL BE SET
49 42013 050105          STA     2,SVEX  ;TEMPORARILY SAVE AC2
50 42014 030075          LDA     2,VRSTP ;GET THE NO. OF VERTICAL STEPS PER LINE
51 42015 073101          DIV             ;AC1 = LINE POSTION
52 42016 030105          LDA     2,SVEX  ;RESTORE AC2
53 42017 000670          JMP     VRTBB   ;SET/CLEAR VERTICAL TAB
54 42020 102120 NCMND:   ADCZL   0,0
55 42021 050135 OCMND:   STA     2,DLLSL ;DLLSL WILL BE 0 FOR DESELECT
56                                       ;AND NON 0 FOR SELECT
57 42022 000635          JMP     TESP2
58
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
!0041  LP201
01              PRDLL:  ;PROCESS DOWN-LINE-LOAD
02 42023 040151         STA     0,ESFLG ;RESET ESCAPE COMMAND FLAG
03 42024 004440         JSR     GETCH
04 42025 101300         MOVS    0,0
05 42026 040077         STA     0,DLLB
06 42027 004435         JSR     GETCH
07 42030 034077         LDA     3,DLLB  ;GET THE LAST BYTE
08 42031 163000         ADD     3,0
09 42032 040077         STA     0,DLLB  ;STORE THE BYTE COUNT
10 42033 004431         JSR     GETCH
11 42034 040076         STA     0,DLLA
12 42035 004427         JSR     GETCH
13 42036 034076         LDA     3,DLLA
14 42037 175300         MOVS    3,3
15 42040 117000         ADD     0,3
16 42041 054076         STA     3,DLLA  ;STORE  THE BYTE ADDRESS.
17 42042 176400         SUB     3,3
18 42043 054100         STA     3,DLLC  ;INITIALIZE THE CHECK SUM
19 42044 004420 TROUT:  JSR     GETCH
20 42045 024100         LDA     1,DLLC
21 42046 107000         ADD     0,1
22 42047 044100         STA     1,DLLC  ;UPDATE THE CHECK-SUM
23 42050 030076         LDA     2,DLLA  ;GET THE BYTE ADDRESS
24 42051 006415 TRUMP:  JSR     @PSTOB  ;STORE THE BYTE
25 42052 010076         ISZ     DLLA
26 42053 000401         JMP     .+1
27 42054 014077         DSZ     DLLB
28 42055 000767         JMP     TROUT
29 42056 004406         JSR     GETCH   ;GET CHECK SUM
30 42057 034031         LDA     3,C377
31 42060 030100         LDA     2,DLLC
32 42061 143000         ADD     2,0
33 42062 117404         AND     0,3,SZR ;SKIP IF CHECK SUM IS OK
34 42063 002003         JMP     @PFALT  ;GO TO ERROR STATUS
35              GETCH:  ;GET THE NEXT DLL CHARACTER OR EXIT IF AC3 IS 0
36 42064 054132         STA     3,DLLF
37 42065 000634         JMP     TOCLR   ;CLEAR BUSY FLAG
38
39 42066 041437 PSTOB:  STOB
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
!0042  LP201
01              TAB:    ;ENTER WITH AC0 = LAST TAB POSITION POSSIBLE
02                      ;AC1 = POSITION WHERE THE TAB IS NEEDED
03                      ;AC2 = -1 TO SET THE TAB AND 0 TO CLEAR IT
04                      ;AC3 = RETURN ADDRESS AND RETURN +1 CONTAINING THE
05                      ;ADDRESS IN PAGE 0 WHERE THE TAB BUFFER STARTS
06 42067 122452         SUBO#   1,0,SZC ;SKIP IF THE TAB IS WITHIN THE RANGE
07 42070 001400         JMP     0,3
08 42071 150000         COM     2,2
09 42072 050162         STA     2,ARGFL ;"ARGFL" WILL BE 0 IF THE TAB HAS TO
10                                      ;BE SET AND -1 IF IT HAS TO BE CLEARED
11 42073 102400         SUB     0,0
12 42074 030050         LDA     2,C20   ;AC2 = 20
13 42075 073101         DIV             ;RETURN WITH AC0 = REMAINDER AND AC1
14                                      ;HAVING QUOTIENT
15 42076 054066         STA     3,RETA  ;SAVE THE RETURN ADDRESS
16 42077 035401         LDA     3,1,3
17 42100 137000         ADD     1,3     ;AC3 = ADDRESS OF THE WORD WHICH HAS THE
18                                      ;TAB BIT IN IT
19 42101 126400         SUB     1,1     ;AC1 = 0
20 42102 152121         ADCZL   2,2,SKP ;AC2 = -2
21 42103 151140         MOVOL   2,2
22 42104 122043         ADCO    1,0,SNC ;SKIP WHEN IT IS OVER
23 42105 000776         JMP     .-2
24 42106 021400         LDA     0,0,3   ;READ THE WORD WITH THE TAB BIT IN IT
25 42107 143400         AND     2,0     ;MASKOUT THE BIT WHICH REPRESENTS THE
26                                      ;POSITION WHERE THE TAB HAS TO BE SET
27                                      ;OR CLEARED
28 42110 010162         ISZ     ARGFL   ;SKIP IF THE TAB WAS TO BE CLEARED
29 42111 142000         ADC     2,0     ;SET THE BIT
30 42112 041400         STA     0,0,3
31 42113 002066         JMP     @RETA
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
10043  LP201
01                CHRST:  ;**A CHARACTER START INTERRUPT WILL BRING THE
02                        ;PROGRAM CONTROL TO THIS ROUTINE
03 42114 024130           LDA     1,HSTFL ;GET THE HORIZONTAL COMMAND THAT WAS
04                                        ;ISSUED TO REACH THIS STEP
05 42115 125005           MOV     1,1,SNR ;SKIP IF A COMMAND TO TAKE HORIZONAL
06                                        ;STEPS WAS ISSUED
07 42116 000541           JMP     HNDMV   ;IF NOT THEN IT MUST BE A MOVEMENT
08                                        ;BY HAND
09 42117 030005           LDA     2,C4    ;AC2 = 4
10 42120 147445           ANDO    2,1,SNR ;SKIP IF MOVING TO THE LEFT
11 42121 176120           ADCZL   3,3     ;AC3 = -2
12 42122 020134           LDA     0,OT3FL ;GET THE LAST OUT 3 COMMAND THAT
13                                        ;WAS ISSUED
14 42123 113414           AND#    0,2,SZR ;SKIP IF PRINT WAS DISABLED
15 42124 000524           JMP     RSTOR   ;OTHERWISE RETURN
16 42125 143000           ADD     2,0     ;SET BIT 13
17 42126 030117           LDA     2,PRTYP ;GET THE PRINT TYPE. 0 FOR REG.
18                                        ;BIT 15 WILL BE 1 FOR COMP. & BIT
19                                        ;0 WILL BE SET FOR ELONGATED
20                        IN      1,1
21 42127 026011             LDA   1,@.PIN+1
22 42130 125100           MOVL    1,1     ;LOAD CARRY WITH HOME FLAG
23 42131 024034           LDA     1,C10
24 42132 151212           MOVR#   2,2,SZC ;SKIP IF NOT IN THE COMP. PRINT MODE
25 42133 024037           LDA     1,C15
26 42134 030101           LDA     2,HPOS  ;GET THE HORIZONTAL POSITION
27 42135 172002           ADC     3,2,SZC ;AC3 IS -2 FOR MOVEMENT TO RIGHT
28                                        ;AND 0 FOR MOTION TO LEFT
29                                        ;SKIP IF IN HOME AND MOVING TO RIGHT
30                                        ;OR IF NOT IN HOME AND MOVING TO LEFT
31 42136 166041           ADCO    3,1,SKP ;INC. IF MOVING TO RIGHT & DEC. IF
32                                        ;MOVING TO LEFT
33 42137 174400           NEG     3,3     ;RESTORE THE CARRY TO WHAT IT WAS
34                                        ;BEFORE AC2 WAS CHANGED
35 42140 146476           SUBC#   2,1,SEZ ;SKIP IF INSIDE HOME AND
36                                        ;AC1 > OR = AC2; OR IF NOT IN HOME
37                                        ;AND AC1 < OR = AC2
38 42141 131000           MOV     1,2
39 42142 151113           MOVL#   2,2,SNC ;SKIP IF THE HORIZONTAL POSITION WILL
40                                        ;BECOME NEGATIVE
41 42143 050101           STA     2,HPOS  ;SAVE THE NEW HORIZONTAL POS.
42 42144 152400           SUB     2,2
43 42145 050167           STA     2,HRCNT ;CLEAR THE FLAG KEEPING TRACK OF HOW
44                                        ;MANY REAL TIME CLOCK INTERRUPTS RE-
45                                        ;CEIVED SINCE THE LAST START CHARACTER
46 42146 050111           STA     2,PRNTIN        ;RE-INITIALIZE THE PRINT
47                                                ;INTERRUPT FLAG
48 42147 024102           LDA     1,HSLEW
49 42150 146043           ADCO    2,1,SNC ;SKIP IF NOT A HORIZ. SLEW
50 42151 044102           STA     1,HSLEW
51 42152 125604           INCR    1,1,SZR ;SKIP IF NOT HORIZ. SLEW OR HORIZ.
52                                        ;SLEW IS OVER
53 42153 000475           JMP     RSTOR
54 42154 044166           STA     1,HT8FL ;0  OUT THE FLAG
55 42155 000416           JMP     PRTST
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
10044  LP201
01                PRINT:  ;**ROUTINE TO PRINT DOTS ON THE PRINTER
02
03 42156 010111           ISZ     PRNTIN  ;UPDATE THE PRINT INTERRUPT COUNTER
04 42157 024131           LDA     1,STPFL ;SEE IF STOP FLAG IS SET
05 42160 125005           MOV     1,1,SNR ;SKIP IF IT IS SET
06 42161 000417           JMP     PRNT1
07 42162 014131           DSZ     STPFL   ;SKIP WHEN "STPFL" = 0
08 42163 000465           JMP     RSTOR
09 42164 065077           RTCDS           ;DISABLE THE REAL TIME CLOCK INT.
10 42165 102400           SUB     0,0
11 42166 040157           STA     0,DSRFL
12 42167 006055           JSR     @PSTOP  ;STOP THE HORIZONTAL MOTOR
13 42170 020036 PRET:     LDA     0,C13   ;AC0 = 13
14 42171 034134           LDA     3,OT3FL
15 42172 163400           AND     3,0     ;MASK OUT BIT 13
16 42173 040134 PRIST:    STA     0,OT3FL ;SAVE THE NEW OUT3 COMMAND
17                        OUT     0,3,3
18 42174 034043             LDA   3,.POUT+3
19 42175 117000             ADD   0,3
20 42176 041400             STA   0,0,3
21 42177 000451           JMP     RSTOR
22
23 42200 020143 PRNT1:    LDA     0,PSPFL ;READ THE SWITCH TO SEE IF THE
24                                        ;PLOTTING MODE IS SELECTED
25 42201 114005           COM     0,3,SNR ;SKIP IF IT IS NOT SELECTED WITH
26                                        ;AC0 = -1
27
28 42202 000516           JMP     PLOT1
29 42203 034113           LDA     3,PRDIR ;GET THE PRINT DIRECTION
30 42204 175415           INC#    3,3,SNR ;SKIP IF PRINTING LEFT TO RIGHT
31                                        ;AC3 = 1
32 42205 034006           LDA     3,C5    ;AC3 = 5
33 42206 030037           LDA     2,C15   ;AC2 = 15
34 42207 020114           LDA     0,PRCNT ;GET THE NUMBER OF COLUMNS LEFT TO
35                                        ;BE PRINTED
36 42210 142453           SUBO#   2,0,SNC ;SKIP IF NOT ELONGATED MODE  PRINTING
37 42211 030111           LDA     2,PRNTIN        ;GET PRINT INTERRUPT COUNTER
38 42212 156442           SUBO    2,3,SZC ;SKIP IF ELONGATED PRINT MODE & 5 OR
39                                        ;LESS PRINT INTERRUPTS HAVE BEEN
40                                        ;RECEIVED WHILE PRINTING RIGHT TO LEFT OR
41                                        ;ONLY ONE INTERRUPT HAS BEEN RECEIVED
42                                        ;WHILE PRINTING LEFT TO RIGHT
43                                        ;ALSO SKIP IF ERRONEOUS PRINT INTERRUPT
44 42213 010116           ISZ     PRSKP   ;SKIP IF PRINT SKIP FLAG IS 1
45 42214 122002           ADC     1,0,SZC ;DECREMENT BUT DON'T MAKE IT NEGATIVE
46 42215 000433           JMP     RSTOR
47 42216 040114           STA     0,PRCNT
48 42217 004451           JSR     MTRIX   ;READ THE CHARACTER MATRIX
49 42220 101202           MOVR    0,0,SZC ;SKIP IF IT WAS AN ODD PRINT INTERRUPT
50 42221 121100           MOVL    1,0     ;LOAD CARRY WITH A 1 IF ELONGATED
51                                        ;PRINT MODE IS ENABLED
52 42222 161002           MOV     3,0,SZC ;SKIP IF NOT ELONG. PRINT MODE OR
53                                        ;IF IT IS ODD PRINT COLUMN
54 42223 004454           JSR     MTRX1
55 42224 100000           COM     0,0
56 42225 117400           AND     0,3
57 42226 116000           ADC     0,3     ;OR AC0 AND AC3
58 42227 161200           MOVR    3,0
59 42230 124102           COML    1,1,SZC ;SKIP IF ELONGATED PRINT MODE
60 42231 151200           MOVR    2,2
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
 0045  LP201
01 42232 024147          LDA     1,SCOR  ;AC1 WILL BE NON 0 IF UNDER SCORE IS
02                                       ;ENABLED
03 42233 125066          MOVC    1,1,SEZ ;DON'T SKIP IF UNDER SCORE IS ENABLED &
04                                       ;IT WAS ODD PRINT POSIOTION (UNLESS
05                                       ;ELONGATED PRINT MODE)
06 42234 115140          MOVOL   0,3
07 42235 020114          LDA     0,PRCNT
08 42236 030461 PLOT2:   LDA     2,C777  ;AC2 = 777
09 42237 157400          AND     2,3
10                       OUT     3,4,2   ;PRINT
11 42240 030044            LDA   2,.POUT+4
12 42241 173000            ADD   3,2
13 42242 041000            STA   0,0,2
14 42243 034035          LDA     3,C12   ;A3 = 12
15 42244 024111          LDA     1,PRNTIN        ;GET THE COUNT OF PRINT
16                                       ;INTERRUPTS
17 42245 166404          SUB     3,1,SZR
18 42246 101005          MOV     0,0,SNR ;SKIP IF PRINT COUNT IS NOT 0
19 42247 000721          JMP     PRET
20 42250 152400 RSTOR:   SUB     2,2     ;ANY TIME AN ENTRY IS MADE TO THIS
21                                       ;POINT THE INTERRUPTS WILL BE ENABLED
22 42251 060277 RSTR1:   INTDS
23 42252 061201          MFSP    0
24 42253 060001          MTFP    0
25 42254 151404          INC     2,2,SZR ;SKIP IF INTERRUPTS ARE NOT TO
26                                       ;BE ENABLED
27 42255 060177          INTEN
28 42256 062601          RET
29
30 42257 030101 HNDMV:   LDA     2,HPOS
31 42260 150000          COM     2,2
32 42261 020144          LDA     0,PLTSL ;GET STATUS OF PLOTTING MODE
33 42262 101004          MOV     0,0,SZR ;SKIP IF NOT IN PLOTTING MODE
34 42263 000705          JMP     PRET    ;DON'T SET ERROR FLAG FOR START CHAR
35 42264 020164          LDA     0,DELAY
36 42265 101005          MOV     0,0,SNR ;SKIP IF DELAY AFTER A STOP COMMAND IS
37                                       ;NOT OVER
38 42266 050127          STA     2,HRTER ;SAVE THE CURRENT HOR. POSITION
39 42267 000701          JMP     PRET
40
41 42270 030117 MTRIX:   LDA     2,PRTYP
42 42271 151102          MOVL    2,2,SZC ;SKIP IF NOT ELONG. PRINT
43 42272 101212          MOVR#   0,0,SZC ;IF ELONGATED PRINT IS ENABLED AND
44                                       ;IT IS ODD PRINT COUNT THEN LEAVE
45                                       ;AC1 TO A 0
46 42273 024113          LDA     1,PRDIR ;GET THE PRINT DIRECTION
47 42274 030115          LDA     2,PRADR ;GET THE COLUMN ADDRESS
48 42275 147000          ADD     2,1
49 42276 044115          STA     1,PRADR ;UPDATE THE COLUMN ADDRESS
50 42277 054067 MTRX1:   STA     3,RETS  ;SAVE THE RETURN ADDRESS
51 42300 024112          LDA     1,PRCHR ;GET THE CHARACTER TO BE PRINTED
52 42301 127120          ADDZL   1,1     ;SHIFT LEFT BY 2 PLACES
53 42302 125120          MOVZL   1,1
54 42303 133000          ADD     1,2
55 42304 024136          LDA     1,DLADR ;AC1 = STARTING ADDRESS JUST IN CASE
56                                       ;DOWN LINE LOADED CHARACTER SET IS
57                                       ;BEING USED, IT WILL BE 0 IF CHAR.
58                                       ;GEN. IS BEING USED
59 42305 134425          NEGZ    1,3,SNR ;SKIP IF USING DOWN LINE LOADED
60                                       ;CHARACTER SET WITH THE CARRY = 0
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
 0046  LP201
01 42306 024047            LDA   1,.POUT+7
02 42307 133002          ADD     1,2,SZC ;SKIP IF USING DOWN LINE LOADED
03                                       ;CHARACTER SET
04 42310 041000            STA   0,0,2
05                       IN      3,0     ;READ THE CHAR. GEN.
06 42311 036010            LDA   3,@.PIN+0
07 42312 125003          MOV     1,1,SNC ;SKIP IF CHAR. GEN. IS BEING USED
08 42313 035000          LDA     3,0,2
09 42314 030115          LDA     2,PRADR
10 42315 024117          LDA     1,PRTYP
11 42316 002067          JMP     @RETS
12
13 42317 000777 C777:    777
14
15 42320 054114 PLOT1:   STA     3,PRCNT ;CLEAR PRINT COUNT
16 42321 034112          LDA     3,PRCHR ;BYTE RECEIVED WILL BE THE BYTE SENT
17                                       ;TO THE HAMMERS
18 42322 000714          JMP     PLOT2
```

```
01                VRSTJ:  ;**ROUTINE TO TAKE VERTICAL STEPS UNDER TIME
02                        ;CONTROL. ENTER AT VRSTJ WITH A JSR AND AT
03                        ;TICK AFTER A TIMED INTERRUPT.
04 42323 060277           INTDS
05 42324 062401           SAV
06 42325 040073           STA     0,VSLEW
07 42326 040070           STA     0,VRTIN ;INIT. THE NUMBER OF VERTICAL INTERRUPTS
08                                        ;EXPECTED
09 42327 176401           SUB     3,3,SKP
10 42330 014073 TICK:     DSZ     VSLEW   ;SKIP AFTER TAKING ALL THE VERTICAL
11                                        ;STEPS
12 42331 000402           JMP     .+2
13 42332 000420           JMP     VRCHK   ;MAKE SURE THAT THE VERTICAL MOTOR
14                                        ;IS MOVING
15 42333 054071           STA     3,VRTWT ;ZERO OUT THE VERTICAL WAIT
16 42334 020072           LDA     0,VRTFL ;GET THE VERTICAL STEP ISSUED LAST
17 42335 024053           LDA     1,C60   ;AC1 = 60
18 42336 034050           LDA     3,C20   ;AC3 = 20
19 42337 101120           MOVZL   0,0
20 42340 106053           ADCO#   0,1,SNC ;SKIP IF BIT 9 OF AC0 IS SET
21 42341 163000           ADD     3,0
22 42342 123400           AND     1,0     ;AC0 HAS THE NEXT STEP
23 42343 040072           STA     0,VRTFL ;SAVE THE VERTICAL STEP FLAG
24 42344 010074           ISZ     VPOS
25 42345 000401           JMP     .+1
26 42346 020130           LDA     0,HSTFL ;AC0 = HORIZONTAL STEP COMMAND
27                        IN      1,6     ;START THE CLOCK
28 42347 026016             LDA   1,@.PIN+6
29 42350 006055           JSR     @PSTOP  ;ISSUE AN OUT 5
30 42351 000677           JMP     RSTOR
31                VRCHK:  ;**ROUTINE TO VARIFY THAT THE VERTICAL MOTOR
32                        ;IS MOVING
33 42352 024070           LDA     1,VRTIN ;GET THE NUMBER OF VERTICAL INTS.
34                                        ;NOT RECEIVED
35 42353 166244           ADCOR   3,1,SZR ;SKIP IF UPTO 2 INT. NOT RECEIVED
36 42354 006003           JSR     @PFALT  ;GO TO ERROR STATUS
37 42355 034742           LDA     3,C777
38 42356 054071           STA     3,VRTWT ;IGNORE THE VERTICAL STEPS TO BE
39                                        ;RECEIVED AFTER ALL THE VERT. STEPS
40                                        ;HAVE BEEN TAKEN FOR 100 MSEC.
41 42357 000671           JMP     RSTOR
42                VRINT:  ;**ROUTINE TO SERVICE VERTICAL INTERRUPT
43 42360 020071           LDA     0,VRTWT
44 42361 101224           MOVZR   0,0,SZR ;SKIP IF A VERTICAL INTERRUPT WAS
45                                        ;EXPECTED
46 42362 000666           JMP     RSTOR
47 42363 020073           LDA     0,VSLEW
48 42364 162040           ADCO    3,0     ;SKIP IF "VSLEW" WAS NOT 0
49 42365 024070           LDA     1,VRTIN ;GET THE COUNTER FOR VERT. INT.
50 42366 166026           ADCZ    3,1,SEZ ;DEC. BUT DON'T MAKE IT 0
51 42367 044070           STA     1,VRTIN
52                        IN      2,3
53 42370 032013             LDA   2,@.PIN+3
54 42371 151103           MOVL    2,2,SNC ;CHECK STATUS OF FORMS
55 42372 006402           JSR     @PFBY   ;OUT OF FORMS GO SET BUSY
56 42373 000655           JMP     RSTOR
57 42374 040336 PFBY:     HDINT
58
```



```
01                INTS:   ;INTERUPT SERVICE
02                        ;SEVEN POSSIBILITIES:
03                        ;CHARACTER START INTERRUPT
04                        ;PRINT INTERRUPT
05                        ;RTC (VERTICAL POSITION INT.)
06                        ;KEYBOARD
07                        ;VERTICAL INTERRUPT
08                        ;SELF TEST
09 42375 054067           STA     3,RETS  ;SAVE AC3
10 42376 034000           LDA     3,0
11 42377 062401           SAV             ;SAVE THE WORLD
12 42400 020067           LDA     0,RETS
13 42401 041777           STA     0,-1,3  ;SAVE AC3 ON THE STACK
14                        IN      0,1
15 42402 022011             LDA   0,@.PIN+1
16 42403 100000           COM     0,0
17 42404 030032           LDA     2,C177
18 42405 143400           AND     2,0     ;SKIP IF A VALID INTERRUPT
19 42406 030413           LDA     2,INTSR
20 42407 126521           SUBZL   1,1,SKP ;AC1 = 1
21 42410 125120           MOVZL   1,1
22 42411 151400           INC     2,2     ;AC2 IS POINTING TO THE ADD. OF THE
23                                        ;INTERRUPT SERVICE ROUTINE
24 42412 101203           MOVR    0,0,SNC ;SKIP IF THIS IS THE INT.
25 42413 000775           JMP     .-3
26                        OUT     1,6,3   ;RESET THE INTERRUPT
27 42414 034046             LDA   3,.POUT+6
28 42415 137000             ADD   1,3
29 42416 041400             STA   0,0,3
30 42417 176400           SUB     3,3
31 42420 003000           JMP     @0,2
32
33 42421 042421 INTSR:    .
34 42422 042114           CHRST
35 42423 042156           PRINT
36 42424 042330           TICK
37 42425 041215           KYBRD
38 42426 042360           VRINT
39 42427 042677           SLFTS
```

```
        PROPRIETARY INFOR IATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 19/9
10049  LP201
01                OFLN0:  ;**ROUTINE TO SET UP THE MACHINE STATUS
02 42430 020033           LDA     0,C7
03 42431 117000           ADD     0,3     ;ADJUST THE RETURN ADDRESS
04                OFLN1:  ;ROUTINE TO CHECK THE MACHINE CONFIGURATION
05 42432 062401           SAV
06                        IN      0,7
07 42433 022017             LDA   0,@.PIN+7
08 42434 101212           MOVR#   0,0,SZC ;SKIP IF AUTO SKIP FEATURE IS NOT
09                                        ;ENABLED
10 42435 024053           LDA     1,C60   ;AC1 = 60 OR 48 DECIMAL
11 42436 044163           STA     1,AUTSK
12 42437 024075           LDA     1,VRSTP ;GET NUMBER OF STEPS FOR LINE FEED
13 42440 101102           MOVL    0,0,SZC ;SKIP IF FORM INITIALIZE IS NOT DESIRED
14 42441 044074           STA     1,VPOS  ;SET VERTICAL POSITION COUNTER
15 42442 050121           STA     2,CMPMD ;COMPRESSED MODE FLAG,
16 42443 050122           STA     2,ALTMD ;AND ALT MODE FLAG.
17 42444 103122           ADDZL   0,0,SZC ;SKIP IF COMPRESS MODE JUMPER IS NOT IN
18 42445 014121           DSZ     CMPMD
19 42446 103112           ADDL#   0,0,SZC ;SKIP IF ALT JUMPER IS NOT IN
20 42447 014122           DSZ     ALTMD
21 42450 030006           LDA     2,C5    ;AC2 = 5
22 42451 105300           MOVS    0,1
23 42452 101200           MOVR    0,0
24 42453 147634           ANDZR#  2,1,SZR ;SKIP IF 6 LINES PER INCH
25 42454 151401           INC     2,2,SKP ;AC2 = 6
26 42455 030034           LDA     2,C10   ;AC2 = 10
27 42456 050075           STA     2,VRSTP ;"VRSTP" HAS THE NUMBER OF STEPS NEEDED
28                                        ;FOR A LINE FEED
29 42457 123500           ANDL    1,0
30 42460 126560           SUBCL   1,1     ;AC1 = 1 IF COMPRESSED PRINT IS DESIRED
31                                        ;0 OTHERWISE
32 42461 044117           STA     1,PRTYP
33 42462 125120           MOVZL   1,1     ;AC1 = 0 FOR REGULAR PRINT AND 2 FOR
34                                        ;COMPRESSED PRINT
35 42463 030034           LDA     2,C10   ;AC2 = 10
36 42464 103122           ADDZL   0,0,SZC ;SKIP IF ALT IS NOT TO BE SELECTED
37 42465 147000           ADD     2,1
38 42466 060277           INTDS
39 42467 020134           LDA     0,OT3FL
40 42470 030006           LDA     2,C5    ;AC2 = 5
41 42471 143400           AND     2,0     ;MASK OUT EVERY THING BUT BITS 13 & 15
42 42472 107000           ADD     0,1
43 42473 044134           STA     1,OT3FL
44 42474 060177           INTEN
45                        IN      0,3     ;READ THE FORMS COUNT IN DECIMAL
46 42475 022013             LDA   0,@.PIN+3
47 42476 024025           LDA     1,C17   ;AC1 = 17
48 42477 107400           AND     0,1
49 42500 030020           LDA     2,C360  ;BITS 8 THRU 11 ARE SET
50 42501 143620           ANDZR   2,0
51 42502 111220           MOVZR   0,2
52 42503 151220           MOVZR   2,2
53 42504 143000           ADD     2,0     ;CONVERTING DECIMAL TO OCTAL
54 42505 107000           ADD     0,1
55 42506 044125           STA     1,LNCNT
56 42507 102400           SUB     0,0
57 42510 030075           LDA     2,VRSTP ;GET THE NUMBER OF VERTICAL STEPS
58                                        ;TO BE TAKEN FOR COMPLETING 1 LINE
59 42511 073301           MUL
60 42512 020405           LDA     0,C2450
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
 0050  LP201
01 42513 106415           SUB#    0,1,SNR ;TEST FOR NO FORM LENGTH SWITCH
02 42514 126400           SUB     1,1     ;CLEAR AC1
03 42515 044024           STA     1,FRMFL
04 42516 002054           JMP     @PRSTR  ;RETURN
05
06 42517 002450 C2450:    2450
07 42520 000360 C360:     360
08
09
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
!0051  LP201
01                RTCLK:  ;**COME HERE TO SERVICE MICRO NOVA REAL TIME CLOCK
02 42521 054172           STA     3,RTSV3 ;SAVE AC3
03 42522 040171           STA     0,RTSV0 ;AND AC0
04 42523 101100           MOVL    0,0
05 42524 040173           STA     0,RTCRY ;SAVE THE CARRY
06 42525 010167           ISZ     HRCNT   ;INCREMENT THE NUMBER OF REAL TIME CLOCK
07                                        ;INTERRUPTS RECEIVED
08 42526 020167           LDA     0,HRCNT
09 42527 034053           LDA     3,C60   ;AC3 = 60
10 42530 162442           SUBO    3,0,SZC ;SKIP IF MORE THAN 48 INTERRUPTS HAVE
11                                        ;BEEN RECEIVED SINCE THE MOTOR STARTED
12                                        ;STEPPING OR SINCE THE LAST PRINT INT.
13 42531 000406           JMP     RTRET   ;RETURN FROM REAL TIME CLOCK INTERRUPT
14 42532 101004           MOV     0,0,SZR ;SKIP IF THIS WAS THE 48TH INTERRUPT
15 42533 000412           JMP     RTCL1
16 42534 034130           LDA     3,HSTFL ;GET THE LAST HORIZONTAL COMMAND THAT
17                                        ;WAS ISSUED
18 42535 054174           STA     3,RTCSV ;AND SAVE IT
19 42536 004443           JSR     STOP
20 42537 020173 RTRET:    LDA     0,RTCRY
21 42540 101200           MOVR    0,0     ;RESTORE THE CARRY
22 42541 020171           LDA     0,RTSV0
23 42542 034172           LDA     3,RTSV3 ;AND THE ACCUMULATORS
24 42543 060177           INTEN
25 42544 002000           JMP     @0      ;RETURN FROM THE REAL TIME CLOCK INT.
26
27 42545 162404 RTCL1:    SUB     3,0,SZR ;SKIP IF THIS WAS THE 96TH REAL TIME
28                                        ;CLOCK INTERRUPT
29 42546 000771           JMP     RTRET
30 42547 040167           STA     0,HRCNT ;0 OUT THE COUNT FOR A RETRY
31 42550 034005           LDA     3,C4    ;AC3 = 4
32 42551 020170           LDA     0,RETRY ;GET THE NUMBER OF RE-TRIES MADE
33 42552 116442           SUBO    0,3,SZC ;SKIP IF LESS THAN 4 RE-TRIES HAVE BEEN
34                                        ;MADE
35 42553 002003           JMP     @PFALT
36 42554 010170           ISZ     RETRY   ;INCREMENT THE RE-TRY COUNT
37 42555 020174           LDA     0,RTCSV ;GET THE HORIZONTAL COMMAND TO BE
38                                        ;ISSUED
39 42556 000760           JMP     RTRET-1
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
!0052  LP201
01                DECST:  ;**ROUTINE TO START THE HORIZONTAL STEPPER MOTOR
02                        ;ENTER WITH BIT 0 OF AC1 A 1 TO MOVE TO THE LEFT
03                        ;AND A 0 TO MOVE TO THE RIGHT
04                        ;LOSES AC0 AND CARRY
05
06 42557 175400           INC     3,3
07 42560 102401           SUB     0,0,SKP ;AC0 = 0
08 42561 102520 STEP:     SUBZL   0,0     ;AC0 = 1 IF THE STEP AT A SLOW SPEED
09                                        ;AND 1 IF IT HAS TO STEP AT A HIGH
10                                        ;SPEED
11 42562 062401           SAV             ;SAVE THE WORLD
12 42563 040167           STA     0,HRCNT ;INIT THE COUNT
13 42564 071077           RCTEN           ;ENABLE THE REAL TIME CLOCK
14 42565 034144           LDA     3,PLTSL ;AC3 WILL BE -1 IF PLOTING MODE IS
15                                        ;SELECTED, 0 OTHERWISE
16 42566 175622           INCZR   3,3,SZC ;SKIP IF IT IS SELECTED
17 42567 034117           LDA     3,PRTYP ;AC3 IS THE PRINT TYPE
18 42570 171100           MOVL    3,2     ;LOAD CARRY WITH 1 IF ELONGATED MODE OR
19                                        ;PLOTTING MODE
20 42571 030102           LDA     2,HSLEW
21 42572 151165           MOVCL   2,2,SNR ;SKIP IF SLEW MOTION IS TO START
22 42573 102400           SUB     0,0     ;ELONGATED PRINT WILL TAKE PLACE AT
23                                        ;INC. SPEED
24 42574 131100           MOVL    1,2
25 42575 111100           MOVL    0,2     ;BIT 0 OF AC2 WILL BE 1 IF STEPPING
26                                        ;TO THE LEFT AND 0 IF STEPPING TO
27                                        ;THE RIGHT
28 42576 151140           MOVOL   2,2
29 42577 117600           ANDR    0,3     ;CARRY WILL GET LOADED WITH 1 IF COMP.
30                                        ;PRINT AND STEPPING AT HIGH SPEED
31 42600 141101           MOVL    2,0,SKP
32 42601 062401 STOP:     SAV
33 42602 060277           INTDS
34 42603 030130           LDA     2,HSTFL ;GET THE LAST HORIZONTAL COMMAND
35 42604 040130           STA     0,HSTFL ;SAVE THE HORIZONTAL COMMAND
36 42605 034072           LDA     3,VRTFL ;GET THE VERTICAL FLAG
37 42606 163000           ADD     3,0     ;AC0 = FINAL OUT 5 COMMAND
38 42607 034006           LDA     3,C5    ;AC3 = 5
39 42610 165620           INCZR   3,1     ;AC1=3
40 42611 173400           AND     3,2     ;MASK OUT EVERYTHING EXCEPT BITS 13 & 15
41 42612 117400           AND     0,3     ;CARRY WILL BECOME 1 ONLY IF BIT 15 OF ONE
42 42613 157200           ADDR    2,3     ;OF THE 2 ACS IS SET
43 42614 137605           ANDR    1,3,SNR ;SKIP IF BIT 13 OR 15 IS DIFFERENT
44                                        ;IN AC2 OR 3
45 42615 126400           SUB     1,1
46 42616 063477           SKPBN   CPU     ;SKIP IF INTERRUPTS WERE ENABLED
47 42617 152000           ADC     2,2     ;AC2 = -1
48                        OUT     0,5,3
49 42620 034045             LDA   3,.POUT+5
50 42621 117000             ADD   0,3
51 42622 041400             STA   0,0,3
52                        OUT     1,6,3   ;CLEAR PRINT AND START CHARACTER
53 42623 034046             LDA   3,.POUT+6
54 42624 137000             ADD   1,3
55 42625 041400             STA   0,0,3
56                                        ;INTERRUPTS CAUSED BY CHANGE IN
57                                        ;DIRECTION FLAG
58 42626 002401           JMP     @PRST1  ;RETURN
59 42627 042250 PRST1:    RSTOR
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
!0053  LP201
01 42630 024061 BELL:   LDA     1,BLCNT ;GET THE COUNTER FOR THE BELL
02 42631 125200         MOVR    1,1     ;CARRY IS 1 IF IT WAS ODD & 0 IF EVEN
03 42632 060277         INTDS
04 42633 024134         LDA     1,OT3FL ;AC1 = LAST OUT 3 COMMAND ISSUED
05 42634 125200         MOVR    1,1     ;BIT 0 IS THE LAST CARRY & NOW THE
06                                      ;CARRY HAS BIT 15 OF LAST OUT 3
07 42635 125162         MOVCL   1,1,SZC ;COMPLEMENT BIT 15 AND SKIP IF
08                                      ;THE BELL COUNT WAS EVEN
09 42636 044134         STA     1,OT3FL
10 42637 060177         INTEN
11                      OUT     1,3,2   ;RING THE BELL
12 42640 030043           LDA   2,.POUT+3
13 42641 133000           ADD   1,2
14 42642 041000           STA   0,0,2
15 42643 001401         JMP     1,3     ;RETURN
16 42644 062401 TESTS:  SAV             ;SET UP FOR RETURN
17 42645 030033         LDA     2,C7    ;LOAD AC2=7
18 42646 020022         LDA     0,FIFOB+2       ;LOAD AC0 WITH FIFOB
19 42647 142023         ADCZ    2,0,SNC ;TEST IF FIFOB IS FULL
20 42650 002054         JMP     @PRSTR  ;YES, RETURN TO SCAN
21 42651 020040         LDA     0,.POUT ;LOAD AC0 WITH CHAR
22 42652 030032         LDA     2,C177  ;LOAD AC2=177
23 42653 112415         SUB#    0,2,SNR ;TEST FOR LAST CHAR
24 42654 020052         LDA     0,C40   ;GET FIRST CHAR
25                                      ;IF IF WAS LAST CHAR
26 42655 040040         STA     0,.POUT ;REPLACE CHAR
27 42656 010040         ISZ     .POUT   ;UPDATE CHAR
28 42657 014041         DSZ     .POUT+1 ;COUNT # CHAR IN LINE
29 42660 000413         JMP     LIND+1  ;NOT END OF THIS LINE
30 42661 020007         LDA     0,D132  ;GET LINE LENGTH
31 42662 101400         INC     0,0
32 42663 040041         STA     0,.POUT+1       ;RESTORE LINE LENGTH
33 42664 020012         LDA     0,.PIN+2        ;GET CHAR THAT STARTED LINE
34 42665 101400         INC     0,0     ;UPDATE CHAR COUNT FOR NEXT LINE
35 42666 112415         SUB#    0,2,SNR ;TEST FOR LAST CHAR
36 42667 020052         LDA     0,C40   ;START WITH FIRST CHAR AGAIN
37 42670 040040         STA     0,.POUT ;PUT CHAR FOR START OF NEXT LINE
38 42671 040012         STA     0,.PIN+2        ;REPLACE UPDATED CHAR
39 42672 020035 LIND:   LDA     0,C12   ;PUT 12 IN AC0 FOR LINE FEED
40 42673 024031         LDA     1,C377
41 42674 122000         ADC     1,0     ;MAKE AC0 LOOK LIKE DATA OF IN2
42 42675 002401         JMP     @PDAT   ;GO TO RDTTO ROUTINE TO
43                                      ;PUT CHAR IN FIFOB
44 42676 041233 PDAT:   STDE
45              SLFTS:  IN      1,4     ;GET MACHINE STATUS
46 42677 026014           LDA   1,@.PIN+4
47 42700 127112         ADDL#   1,1,SZC ;ARE WE OFF LINE
48 42701 002054         JMP     @PRSTR  ;NO RETURN
49 42702 102620         SUBZR   0,0     ;MAKE AC0 EQUAL TO 100000
50 42703 040175         STA     0,STFLG ;SET SELF TEST FLAG
51 42704 020052         LDA     0,C40   ;GET CHAR TO START LINE
52 42705 040040         STA     0,.POUT ;SAVE THE CHAR
53 42706 040012         STA     0,.PIN+2        ;SAVE INITIAL CHAR
54 42707 020007         LDA     0,D132  ;GET LINE LENGTH
55 42710 040041         STA     0,.POUT+1       ;SET UP LINE LENGTH
56 42711 002060         JMP     @PSCAN
57
```

```
        PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
        COPYRIGHT DGC, 1979
!0054  LP201
01                      INITA:  ;INITIALIZATION BLOCK TO BE MOVED TO LOCATION 1
02                              ;IN RAM SPACE.
03
04        042711 ZREL   =.-1    ;DISTANCE THIS BLOCK MUST BE MOVED DOWN.
05 42712 042375         INTS    ;MUST BE 1
06 42713 042521         RTCLK   ;LOC. 2 REAL TIME CLOCK INT. VECTOR
07        000003 PFAIT  =.-ZREL
08 42714 040375         HELP    ;STACK ERROR OR SOME OTHER FAULT
09        000004 RINIT  =.-ZREL
10 42715 040043         INIT
11        000005 C4     =.-ZREL
12 42716 000004         4
13        000006 C5     =.-ZREL
14 42717 000005         5
15        000007 D132   =.-ZREL
16 42720 000204         132.
17        000010 .PIN   =.-ZREL
18 42721 037770         37770
19 42722 037771         37771
20 42723 037772         37772
21 42724 037773         37773
22 42725 037774         37774
23 42726 037775         37775
24 42727 037776         37776
25 42730 037777         37777
26
27
28        000020 FIFOB  =.-ZREL ;MUST BE AT LOCATION 20
29 42731 002777         3000-1
30 42732 000000         0
31 42733 003000         3000
32 42734 001020         81FOB*2
33
34        000024 FRMFL  =.-ZREL
35        000024 AUTIN  =.-ZREL
36 42735 007767         7767    ;MUST BE AT AN AUTO INC. LOCATION
37        000025 C17    =.-ZREL
38        000025 FIFOA  =.-ZREL
39 42736 000017         20-1
40 42737 000000         0
41 42740 000020         20
42        000030 C1000  =.-ZREL
43 42741 001000         81FOA*2
44
45        000031 C377   =.-ZREL
46 42742 000377         377
47        000032 C177   =.-ZREL
48 42743 000177         177
49        000033 C7     =.-ZREL
50 42744 000007         7
51        000034 C10    =.-ZREL
52 42745 000010         10
53        000035 C12    =.-ZREL
54 42746 000012         12
55        000036 C13    =.-ZREL
56 42747 000013         13
57        000037 C15    =.-ZREL
58 42750 000015         15
59        000040 .POUT  =.-ZREL
60 42751 040000         40000
```

```
01 42752 044000          44000
02 42753 050000          50000
03 42754 054000          54000
04 42755 060000          60000
05 42756 064000          64000
06 42757 070000          70000
07 42760 074000          74000
08       000050 PFIFB    =.-ZREL
09       000050 C20      =.-ZREL
10 42761 000020          20
11       000051 C33      =.-ZREL
12 42762 000033          33
13       000052 C40      =.-ZREL
14 42763 000040          40
15       000053 C60      =.-ZREL
16 42764 000060          60
17       000054 PRSTR    =.-ZREL
18 42765 042250          RSTOR
19       000055 PSTOP    =.-ZREL
20 42766 042601          STOP
21       000056 PSTEP    =.-ZREL
22 42767 042561          STEP
23       000057 PDECS    =.-ZREL
24 42770 042557          DECST
25       000060 PSCAN    =.-ZREL
26 42771 040470          SCAN
27       000061 BLCNT    =.-ZREL
28 42772 010000          10000
29       000062 LINES    =.-ZREL
30 42773 177777          -1
31       000063 CHRDY    =.-ZREL
32 42774 177777          -1
33       000064 ECLCT    =.-ZREL
34 42775 000001          1
35       000065 C2       =.-ZREL
36 42776 000002          2
37       042777 END      =.
38       000001 ROM      =BEGIN+3000-.   ;ROOM REMAINING IN ROM (MUST BE POS).
39                       ;LAST LOCATION CONTAINS 40000' WHEN
40                       ;MACHINE IS POWERED UP HARDWARE SENDS
41                       ;CPU TO LAST MEMORY LOCATION BY DE-
42                       ;FAULT CPU JUMPS TO LOCATION CON-
43                       ;TAINED HERE AND STARTS EXECUTION
44                       ;OF THE PROGRAM AT 40000'
45                       ;END OF THE INITIALIZATION BLOCK
```

PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
COPYRIGHT DGC, 1979

**00001 TOTAL ERRORS, 00001 FIRST PASS ERRORS

PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
COPYRIGHT DGC, 1979

FIFOB	000020		23/02	53/18	54/28#				
FRMFL	000024		16/02	16/15	16/26	50/03	54/34#		
GET	041033		17/06	24/16	27/01#				
GET1	041035		20/11	24/18	27/16#				
GET2	041045		24/34	27/24#					
GET4	040416		20/11#	23/36					
GETCH	042064		41/03	41/06	41/10	41/12	41/19	41/29	41/35#
GOTIT	040662		24/21	24/36#					
GTIT1	040674		24/04	24/39	24/51#				
GTIT2	040716		25/03	25/10#					
HDINT	040336		19/17#	47/57					
HELP	040375		19/53#	54/08					
HNDMV	042257		43/07	45/30#					
HPOS	000101		9/31#	15/29	16/47	17/58	21/16	25/40	40/39
			43/26	43/41	45/30				
HRCNT	000167		11/60#	43/43	51/06	51/08	51/30	52/12	
HRTAB	041714		35/60	38/14	39/24#				
HRTER	000127		10/27#	15/32	24/58	45/38			
HRZTB	042002		38/26	40/39#					
HSLEW	000102		9/33#	15/28	17/15	18/07	18/45	23/52	28/09
			28/14	43/48	43/50	52/20			
HSTFL	000130		10/31#	18/52	21/31	25/19	28/11	36/21	43/03
			47/26	51/16	52/34	52/35			
HTAB	000211		12/31#	31/51	39/31	40/43			
HTBFL	000166		11/57#	23/51	28/15	43/54			
IHTAB	042006		40/43#						
IN	006756	MC	8/07#	14/29	15/04	15/11	15/18	19/24	21/05
			22/14	23/09	23/20	24/36	30/28	31/03	33/40
			43/20	46/05	47/27	47/52	48/14	49/06	49/45
			53/45						
IN0	007115	MC	46/06#						
IN1	007057	MC	15/05#	15/12	15/19	43/21	48/15		
IN2	007043	MC	14/30#	31/04					
IN3	007073	MC	23/21#	33/41	47/53	49/46			
IN4	007062	MC	19/25#	21/06	22/15	23/10	24/37	53/46	
IN5	007076	MC	30/29#						
IN6	007120	MC	47/28#						
IN7	007123	MC	49/07#						
INILP	040004		14/11#	14/15					
INIT	040043		15/01#	15/09	54/10				
INITA	042712		9/04	14/48	54/01#				
INTRT	040102		15/10	15/14	15/17	15/21	15/30	15/40#	
INTS	042375		48/01#	54/05					
INTSR	042421		48/19	48/33#					
IS33	041416		31/28	33/40#					
ITAB	041723		39/20	39/32#					
KEYT0	041306		31/47	31/56#					
KEYT1	041174		30/02#	32/16					
KEYT2	041406		32/09	33/29#					
KEYT3	041407		31/60	33/30#					
KEYT4	041340		31/32	32/32#	35/37	35/59			
KEYTB	041335		30/10	32/29#	33/35				
KYBRD	041215		30/25#	48/37					
LDSPC	000123		10/16#	32/11	33/06	33/29	35/07		
LFTIN	040056		15/07	15/16#					
LFTPR	040271		15/38	17/57	18/23#				
LI	000001		8/08#	27/24	34/12	34/17			
LIFO	040653		24/14	24/25#					

LIND	042672		53/29	53/39#					
LINES	000062		16/50	17/50	26/49	32/10	32/37	35/30	55/29#
LNCNT	000125		10/23#	39/19	49/55				
LNEND	041342		31/45	32/35#					
LNFR1	040326		19/09#	21/29					
LNFR2	040443		19/11	19/16	21/30#				
LNFRM	040437		21/13	21/24#					
LNSIZ	000126		10/25#	30/05	32/45	33/10	33/31		
LO	000002		8/09#	23/02	24/31	24/33	27/18	27/22	34/10
LOBE	041054		27/51#						
LTOFL	000177		12/21#	16/48	19/09	22/23	22/29	23/46	26/19
MASK	000000		8/07#	27/17	27/26	34/13			
MCIN0	000001		8/07#	46/06#					
MCIN1	000001		8/07#	15/05#	15/12	15/19	43/21	48/15	
MCIN2	000001		8/07#	14/30#	31/04				
MCIN3	000001		8/07#	23/21#	33/41	47/53	49/46		
MCIN4	000001		8/07#	19/25#	21/06	22/15	23/10	24/37	53/46
MCIN5	000001		8/07#	30/29#					
MCIN6	000001		8/07#	47/28#					
MCIN7	000001		8/07#	49/07#					
MCOT0	000000		8/07#						
MCOT1	000001		8/07#	19/34#	23/48				
MCOT2	000001		8/07#	14/33#	19/47	22/42			
MCOT3	000001		8/07#	39/54#	44/18	53/12			
MCOT4	000001		8/07#	45/11#					
MCOT5	000001		8/07#	52/49#					
MCOT6	000001		8/07#	14/26#	48/27	52/53			
MCOT7	000000		8/07#						
MCPL0	000000		8/07#						
MCPL1	000000		8/07#						
MCPL2	000000		8/07#						
MCPL3	000001		8/07#	14/37#					
MCPL4	000000		8/07#						
MCPL5	000000		8/07#						
MCPL6	000000		8/07#						
MCPL7	000000		8/07#						
MRST	041766		38/55	40/22#					
MRST1	041773		40/26	40/27#					
MRST2	040031		14/38#	40/27					
MSKOT	041060		27/39#						
MTRIX	042270		44/48	45/41#					
MTRX1	042277		44/54	45/50#					
NCMND	042020		38/19	40/54#					
NOMOR	041464		35/12#	37/34					
NXTLN	040136		16/10#	19/08	28/19				
OCMND	042021		38/19	40/55#					
OFLN0	042430		23/07	49/01#					
OFLN1	042432		17/01	49/04#					
OFLN2	041113		26/20	28/22#					
OFLST	040455		21/43#	22/18					
OFRET	040506		21/47	22/19#					
OT3FL	000134		10/42#	15/43	15/45	39/45	39/52	43/12	44/14
			44/16	49/39	49/43	53/04	53/09		
OTW0	040367		19/46#	19/57	19/60				
OUT	006774	MC	8/07#	14/25	14/32	19/33	19/46	22/41	23/47
			39/53	44/17	45/10	48/26	52/48	52/52	53/11
OUT1	007065	MC	19/34#	23/48					
OUT2	007046	MC	14/33#	19/47	22/42				

```
SKAU   040132      16/05#  16/36
SLCHK  040312      18/52#  23/08
SLFTS  042677      48/39   53/45#
SNBY   040342      19/18   19/21#  19/55   21/45
SNBYA  040340      19/19#  20/09
SNBYZ  040414      20/09#  23/04
SNCL   040462      21/49#  23/25
STAK   040204      14/22   16/54#
STDE   041233      31/05#  53/44
STEP   042561      52/08#  55/22
STFL1  041355      32/42   32/52#
STFLG  000175      12/17#  22/30   23/26   53/50
STOB   041437      32/25   32/47   32/51   34/20#  35/35   41/39
STOP   042601      51/19   52/32#  55/20
STOT3  041731      39/44#  40/17
STP1   040321      16/12   19/01#  28/20
STPFL  000131      10/33#  19/04   23/58   44/04   44/07
SVEX   000105       9/42#   9/44   35/13   35/21   35/24   37/08   37/47
                   40/49   40/52
SVTBL  041627      38/14#  38/53
SWTIM  000150      11/19#  16/08   21/25   21/30   25/17
TA8    042067      39/29   39/32   40/41   42/01#
TBCAL  041130      17/02   29/01#  31/49
TBCL0  041155      29/36#  29/43
TBCL1  041156      29/32   29/37#
TBCL2  041165      29/34   29/45#
TBCL3  041172      29/40   29/50#
TBDCO  041071      25/09   28/02#
TBELL  041401      32/07   33/24#
TBFL   000200      12/23#  25/16   28/04   28/07
TBRPT  041176      30/04#  30/21
TEMP1  000103       9/37#  17/03   17/41   29/23   29/37   30/17   30/20
                   32/35   32/54
TEMP2  000104       9/39#  22/21   22/26   22/37
TEMP3  000070       9/41#  15/03   15/47
TEMP4  000105       9/44#  29/15   29/30
TEMP5  000106       9/45#  16/56   17/23
TESP1  041662      38/17   38/48#  38/52
TESP2  041657      38/15   38/21   38/23   38/44#  40/57
TESTS  042644      20/07   53/16#
TICK   042330      47/10#  48/36
TOCLR  041721      38/23   39/30#  41/37
TOINT  041024      24/60   26/44#
TOKEY  041310      30/03   31/60#
TPMF   041030      25/28   26/48#
TPMFA  040736      25/29#  26/50
TROUT  042044      41/19#  41/28
TRTDC  041654      35/14   38/39#
TRUMP  042051      41/24#
TSCAN  042001      38/30   38/32   38/35   40/37#
VPOS   000074       9/20#  15/48   16/16   16/19   16/29   40/45   47/24
                   49/14
VRCHK  042352      47/13   47/31#
VRCMD  041676      38/30   39/08#
VRINT  042360      47/42#  48/38
VRSTJ  042323      17/18   47/01#
VRSTP  000075       9/22#  15/49   15/56   16/34   16/39   40/50   49/12
                   49/27   49/57
```



```
VRTAB  042007      38/27   40/44#
VRTBB  041707      39/18#  40/53
VRTER  000133      10/40#
VRTFL  000072       9/15#  47/16   47/23   52/36
VRTIN  000070       9/10#   9/41   47/07   47/33   47/49   47/51
VRTTB  040112      15/48#  16/23
VRTWT  000071       9/12#  22/10   22/12   47/15   47/38   47/43
VSLEW  000073       9/17#  21/24   25/12   36/24   40/46   47/06   47/10
                   47/47
VTAB   000202      12/27#  15/52   39/22
VUCNS  040175      15/59   16/06   16/46#  18/32
VUFLG  000145      11/09#  18/30   21/21   24/54
VURST  040274      18/28#  24/22
VUSLU  040301      18/34#  21/22
VUTIM  000165      11/55#  18/33   21/09   21/12
ZCMND  041660      38/20   38/46#
ZREL   042711      54/04#  54/07   54/09   54/11   54/13   54/15   54/17
                   54/28   54/34   54/35   54/37   54/38   54/42   54/45
                   54/47   54/49   54/51   54/53   54/55   54/57   54/59
                   55/08   55/09   55/11   55/13   55/15   55/17   55/19
                   55/21   55/23   55/25   55/27   55/29   55/31   55/33
                   55/35
.PIN   000010      14/30   15/05   15/12   15/19   19/25   21/06   22/15
                   23/10   23/21   24/37   30/29   31/04   33/41   43/21
                   46/06   47/28   47/53   48/15   49/07   49/46   53/33
                   53/38   53/46   53/53   54/17#
.POUT  000040      14/26   14/33   14/37   19/34   19/47   22/42   23/48
                   39/54   39/57   44/18   45/11   46/01   48/27   52/49
                   52/53   53/12   53/21   53/26   53/27   53/28   53/32
                   53/37   53/52   53/55   54/59#
```

PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION,
COPYRIGHT DGC, 1979
0065 LP2U1

THIS IS A ROM MAP FOR THE PROGRAM USED BY THE MICRONOVA IN THE DASHER LP2 AND TP2 PRINTERS. EACH PROM CONTAINS ONE HALF AN INSTRUCTION WORD (ONE BYTE) AND 512 LOCATIONS.

PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION
COPYRIGHT DGC, 1979
0066 LP2U1
THE FIRST 512 LOCATIONS ARE CONTAINED IN THE PROMS WITH DG NO.-

		100-2130	100-2127
40000	000	01000001	00000001
40001	001	00110001	00100001
40002	002	10101100	00000000
40003	003	00111001	01010011
40004	004	00100010	11111111
40005	005	01000011	00000000
40006	006	10110110	00000000
40007	007	10111110	00000100
40010	008	00000001	11111100
40011	009	00110000	00011100
40012	010	01001100	00010100
40013	011	11110100	00000100
40014	012	00000001	11111110
40015	013	00100001	01110111
40016	014	01100010	00000001
40017	015	00100000	00011001
40020	016	00111000	00100110
40021	017	10011110	00000000
40022	018	01000011	00000000
40023	019	00100100	00001010
40024	020	00100000	00101010
40025	021	00111000	00100010
40026	022	10011110	00000000
40027	023	01000011	00000000
40030	024	01000100	00100011
40031	025	00111001	00111101
40032	026	11101001	01010000
40033	027	11111011	00000000
40034	028	01010011	00000000
40035	029	10101011	00000100
40036	030	00000001	11111101
40037	031	00001101	01101001
40040	032	00001100	00000100
40041	033	00000001	11111111
40042	034	01000110	00000000
40043	035	01011000	00111000
40044	036	00101100	00001001
40045	037	10101010	01001010
40046	038	00000001	00001000
40047	039	00001100	00101111
40050	040	01000000	00100011
40051	041	00001001	00011001
40052	042	00101100	00001001
40053	043	10101010	01001011
40054	044	00000001	00010111
40055	045	00001100	00101101
40056	046	00001100	00101110
40057	047	00001001	00010011
40060	048	00100100	00001001
40061	049	10000010	01000010
40062	050	00000001	00010001
40063	051	01100000	10111111
40064	052	00111000	01001111
40065	053	00101000	00011111
40066	054	11111010	10001011
40067	055	00101000	00011100
40070	056	01001000	01000010

```
40071 057 01001000 01000001
40072 058 00001001 00001000
40073 059 01010000 01010111
40074 060 00111001 11101100
40075 061 01011000 00000100
40076 062 00010000 01001011
40077 063 00000001 01111001
40100 064 10100001 00000000
40101 065 00000001 01111000
40102 066 01011000 00000100
40103 067 00111000 00011110
40104 068 01100000 10111111
40105 069 00100000 01011100
40106 070 11100111 00000000
40107 071 01000000 01011100
40110 072 01100000 01111111
40111 073 00000100 00111000
40112 074 00101000 00111100
40113 075 00110000 00111101
40114 076 01110110 01000001
40115 077 00001101 00111100
40116 078 00000000 10000010
40117 079 00000000 00000111
40120 080 10101010 00000101
40121 081 00000001 00101101
40122 082 00110000 00111101
40123 083 01110110 11000001
40124 084 10100010 00000000
40125 085 00000001 00101000
40126 086 00000000 00110110
40127 087 00111000 00010100
40130 088 11111010 00000101
40131 089 00000001 00100101
40132 090 11000110 00000000
40133 091 00000001 00100010
40134 092 00110001 01101101
40135 093 01010000 01101000
40136 094 10011010 00000100
40137 095 00000001 01110010
40140 096 11010100 00000000
40141 097 01010000 00110011
40142 098 00110000 00010100
40143 099 00111000 00111100
40144 100 11011101 00100011
40145 101 01011000 00111100
40146 102 00100000 00011110
40147 103 10100101 00000101
40150 104 00000001 11100010
40151 105 10101010 10000010
40152 106 00000001 00010100
40153 107 00100000 00010100
40154 108 10000010 00000101
40155 109 00000001 00001000
40156 110 00111000 00111100
40157 111 00110000 01110011
40160 112 11110110 00000000
40161 113 10010101 00100000
```



```
40162 114 00110000 00111101
40163 115 11100101 00000010
40164 116 00000001 11100110
40165 117 10101010 10000011
40166 118 00000001 11100001
40167 119 00100000 00111101
40170 120 00111000 01100011
40171 121 11111010 00000100
40172 122 00100000 00000110
40173 123 11111101 00000000
40174 124 01011000 01100011
40175 125 00001101 00010110
40176 126 00101000 01000001
40177 127 00010000 01111111
40200 128 00000001 00111000
40201 129 00011000 00110010
40202 130 00000001 00000001
40203 131 00001101 00001001
40204 132 00000000 10010101
40205 133 00000000 00010001
40206 134 01000000 01000110
40207 135 00001101 00000101
40210 136 01000101 00011010
40211 137 01000010 01011000
40212 138 01000000 01000011
40213 139 00001101 00000001
40214 140 01000010 00011011
40215 141 00000000 01000001
40216 142 00101000 00000111
40217 143 10001101 00101010
40220 144 10100010 00000000
40221 145 01000000 01000010
40222 146 00001101 11111010
40223 147 01000100 11010011
40224 148 01000010 00001100
40225 149 10001000 00000000
40226 150 01001000 01001000
40227 151 00111000 01110001
40230 152 00110000 01000110
40231 153 00101000 00000111
40232 154 11001101 00100011
40233 155 00000001 00000011
40234 156 10110110 00000000
40235 157 10101101 00000000
40236 158 11111010 01001010
40237 159 10000010 01010000
40240 160 10001101 00101010
40241 161 10100010 00000000
40242 162 11111010 01001010
40243 163 10000010 10010000
40244 164 00101000 01100100
40245 165 10101010 10010011
40246 166 00101000 01000011
40247 167 10101010 10011101
40250 168 01000000 01000111
40251 169 10111001 00100101
40252 170 00111000 00110010
```

```
40253 171 11101010 01000000
40254 172 10000010 01000101
40255 173 00000001 00001101
40256 174 00101000 01000001
40257 175 11001101 00010110
40260 176 11111010 01000010
40261 177 00000001 00000111
40262 178 00100000 01000010
40263 179 11000101 00000000
40264 180 10001100 00101010
40265 181 10000011 00000000
40266 182 10100101 00100000
40267 183 10001101 00001011
40270 184 10100001 00000001
40271 185 11111100 00000001
40272 186 11111101 01010000
40273 187 01011000 01001011
40274 188 10101101 00000000
40275 189 01001000 01111000
40276 190 01001000 01100101
40277 191 00101001 10111110
40300 192 01001000 01110101
40301 193 10001010 01000010
40302 194 10000001 00000000
40303 195 10101100 10000000
40304 196 10111101 00001101
40305 197 11100110 00000000
40306 198 01000000 01000010
40307 199 10010010 00000101
40310 200 00000001 01110000
40311 201 00000101 11001011
40312 202 00101000 01011000
40313 203 00110000 00000101
40314 204 11001111 00000100
40315 205 10101100 00000000
40316 206 00111000 00011011
40317 207 10011101 00100011
40320 208 00001100 00101111
40321 209 10010010 00000100
40322 210 00110000 00000101
40323 211 01010000 01011001
40324 212 00000001 01100100
40325 213 01000000 01011100
40326 214 01001000 01111111
40327 215 10110100 00100011
40330 216 00000001 01001011
40331 217 11111010 10001011
40332 218 10101011 01010001
40333 219 11111010 01001011
40334 220 00000101 11111001
40335 221 00000001 01000111
40336 222 01010000 01010000
40337 223 00000001 00000100
40340 224 00100000 00011000
40341 225 01000000 01111110
40342 226 11010100 00000001
40343 227 00110000 00011001
```



```
40344 228 01010000 10000001
40345 229 00100100 00001100
40346 230 00110000 00110101
40347 231 11000111 00000100
40350 232 00000011 00000000
40351 233 00100001 00011110
40352 234 00110000 10000001
40353 235 11010010 00000101
40354 236 00100001 10011001
40355 237 00110000 00100001
40356 238 10010110 00000000
40357 239 01000010 00000000
40360 240 00000011 00000000
40361 241 00111000 01110000
40362 242 11111010 00000101
40363 243 00111001 01101110
40364 244 11111011 00000101
40365 245 01011000 01101111
40366 246 01011000 01110000
40367 247 00110000 00100010
40370 248 10010110 00000000
40371 249 01000010 00000000
40372 250 00110001 10010011
40373 251 10010101 00000100
40374 252 00000001 00111100
40375 253 10000101 00000000
40376 254 00001100 00101101
40377 255 00001001 11100011
40400 256 00100001 10001101
40401 257 00000001 11110110
40402 258 00100001 00000010
40403 259 00000001 11110100
40404 260 00000000 00111100
40405 261 00000000 00101111
40406 262 00000000 01111100
40407 263 00000000 00010011
40410 264 00000000 00111110
40411 265 01000010 10011001
40412 266 01000101 10100100
40413 267 01000101 10011000
40414 268 01000000 11100000
40415 269 00000000 00100110
40416 270 01000010 00011101
40417 271 00111000 01001100
40420 272 11100010 00000100
40421 273 00000001 00100111
40422 274 00111100 00001100
40423 275 11111110 11010000
40424 276 00101000 01110101
40425 277 10101010 00000110
40426 278 00011000 01110101
40427 279 00000001 00001000
40430 280 00100000 00011011
40431 281 00101000 01000001
40432 282 00110001 11101100
40433 283 10110101 00100010
40434 284 10000000 00000000
```

```
40435 285 01000000 01100101
40436 286 00000001 10100011
40437 287 00101000 00111011
40440 288 00110000 01101000
40441 289 10101010 00000101
40442 290 00000001 10110100
40443 291 01010000 01101000
40444 292 00110000 01011000
40445 293 11010010 00000101
40446 294 00000001 00010010
40447 295 00001100 00101101
40450 296 01101010 00111111
40451 297 00100000 01000111
40452 298 10000010 00000101
40453 299 00101000 00011001
40454 300 00000001 00001111
40455 301 00100000 10000001
40456 302 10000010 00001101
40457 303 00001001 10110100
40460 304 00100001 11011101
40461 305 00000001 00010101
40462 306 10000101 00000000
40463 307 01000000 10000001
40464 308 01000000 01010000
40465 309 00001001 10110000
40466 310 00000001 00000010
40467 311 01000000 01101010
40470 312 11111101 00000000
40471 313 00101000 01110100
40472 314 11101100 00100011
40473 315 01001000 01110100
40474 316 00011000 00110001
40475 317 00001101 11001110
40476 318 00010000 00110001
40477 319 00110000 00111001
40500 320 11010010 10010100
40501 321 00011000 00111001
40502 322 00101100 00001100
40503 323 00100001 11000101
40504 324 10101110 01000011
40505 325 00000001 11101000
40506 326 11010100 10000000
40507 327 01010000 01000100
40510 328 00111000 01111111
40511 329 00110000 00011001
40512 330 11011101 00001100
40513 331 00110000 01000100
40514 332 00111000 00110011
40515 333 11111011 00000101
40516 334 01010000 01111111
40517 335 00111000 01111101
40520 336 11111010 01001010
40521 337 00100001 10111100
40522 338 00111000 00000110
40523 339 00110000 10000001
40524 340 11010010 00001100
40525 341 11100100 00000000
```



```
40526 342 00110000 01000100
40527 343 00111000 01110000
40530 344 11111010 00000100
40531 345 00100001 10101100
40532 346 00111000 00100010
40533 347 10011110 00000000
40534 348 01000011 00000000
40535 349 10111010 11000000
40536 350 11111010 01001011
40537 351 00000001 00000111
40540 352 00111000 01101111
40541 353 11111010 00000101
40542 354 11111011 00000000
40543 355 11111011 00000101
40544 356 00000001 10001101
40545 357 01011000 01101111
40546 358 11001111 01000011
40547 359 00000001 00001111
40550 360 00111000 00101011
40551 361 00100000 10000001
40552 362 10011111 00001100
40553 363 00000001 00001000
40554 364 00100000 00010010
40555 365 11100100 00010011
40556 366 00001101 10011110
40557 367 00001101 10011010
40560 368 00000001 00000110
40561 369 01000101 00011000
40562 370 01000000 11001010
40563 371 00100100 00001100
40564 372 10000010 10000011
40565 373 00000001 11111010
40566 374 11001111 01000011
40567 375 00000001 00011010
40570 376 10101110 01010011
40571 377 00000001 10001001
40572 378 01001000 00110110
40573 379 00100000 00011001
40574 380 00111100 00001011
40575 381 11111010 01000010
40576 382 00111000 10000001
40577 383 10011101 00001101
40600 384 00000001 10110010
40601 385 00100000 01111101
40602 386 10000010 01001010
40603 387 00001101 10000111
40604 388 00111000 00110011
40605 389 11111011 00001101
40606 390 00001101 10001000
40607 391 00000001 00001010
40610 392 00101000 00110110
40611 393 10101010 01000011
40612 394 00000001 00000100
40613 395 01000000 00110011
40614 396 00111000 00011001
40615 397 01011000 01111111
40616 398 00111000 00100001
```

```
40617 399 10011110 00000000
40620 400 01000011 00000000
40621 401 00101000 01110110
40622 402 00100000 01000010
40623 403 10101010 00000101
40624 404 10000010 00000101
40625 405 00000001 00000010
40626 406 00000101 11011100
40627 407 00101000 01011001
40630 408 10101010 00000100
40631 409 00000001 10011111
40632 410 00100000 00110011
40633 411 10000011 00001100
40634 412 00000001 00100000
40635 413 11010011 01010101
40636 414 00001101 11010011
40637 415 00110000 01000111
40640 416 11000110 00100011
40641 417 01000000 01000111
40642 418 00101000 01001011
40643 419 10101011 00001101
40644 420 00000001 00000111
40645 421 00001001 01110110
40646 422 00001001 01110111
40647 423 00000101 01101100
40650 424 00000001 00001010
40651 425 01000000 10111100
40652 426 01000001 00110111
40653 427 11000001 00100101
40654 428 00100000 01001000
40655 429 00110000 00101000
40656 430 00101010 00000010
40657 431 10001101 00000011
40660 432 01001010 00000010
40661 433 00001001 01110100
40662 434 00110100 00001100
40663 435 11010110 01001011
40664 436 00000001 00000111
40665 437 00110000 01101010
40666 438 11010010 00000100
40667 439 00000101 01011011
40670 440 00110000 00101001
40671 441 10010101 00001101
40672 442 00000101 11110000
40673 443 01000000 00110011
40674 444 00110000 01010000
40675 445 11010010 00000100
40676 446 00000101 01010101
40677 447 00100000 01100101
40700 448 10000001 00000100
40701 449 00000101 11101000
40702 450 00101000 01010111
40703 451 10101010 00000100
40704 452 00000001 01010000
40705 453 00110000 01001100
40706 454 11010010 10011100
40707 455 00000001 00000111
```



```
40710 456 00100000 00110011
40711 457 00111000 00011010
40712 458 10011101 00100000
40713 459 00101000 01001011
40714 460 11111001 00000110
40715 461 00000001 01101100
40716 462 11010010 00000101
40717 463 00110000 00111011
40720 464 11010010 00000100
40721 465 00000100 00110000
40722 466 01010000 10000000
40723 467 01010000 01101000
40724 468 00100000 01011000
40725 469 00101000 00110011
40726 470 00111000 00011110
40727 471 10111101 10101100
40730 472 00111000 00011111
40731 473 10111101 10100101
40732 474 00000101 01101111
40733 475 00110000 01100100
40734 476 11010010 00000100
40735 477 00000001 00111011
40736 478 11010011 00000101
40737 479 00000100 00110000
40740 480 11010100 00000000
40741 481 01010000 00110011
40742 482 11111000 00110101
40743 483 00000101 00101110
40744 484 01001000 01001010
40745 485 00101000 01001011
40746 486 00111000 01000001
40747 487 10110000 01100010
40750 488 00110000 00000111
40751 489 11011101 00000111
40752 490 00000101 01100000
40753 491 00110000 01100110
40754 492 01010000 01100111
40755 493 00110000 01011111
40756 494 01010000 01011110
40757 495 00110000 01110001
40760 496 00111000 01001111
40761 497 11111010 01000000
40762 498 11010010 01000000
40763 499 11111010 10000000
40764 500 01011000 01001111
40765 501 11010010 01000000
40766 502 00110000 00011011
40767 503 10101010 01001011
40770 504 11010101 01110000
40771 505 01010000 01001101
40772 506 00110000 00011100
40773 507 11000111 00100100
40774 508 11000010 10010000
40775 509 11111010 01000010
40776 510 00110000 00011111
40777 511 01010000 01001100
```

PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION
COPYRIGHT DGC. 1979
0075 LP201
THE NEXT 512 LOCATIONS ARE CONTAINED IN THE PROMS WITH NO.-

		100-2131	100-2128
41000	000	00010000	01111111
41001	001	00000001	01001010
41002	002	00110000	01000111
41003	003	00111000	01001000
41004	004	11011110	00000000
41005	005	10000010	00000100
41006	006	10011110	00101011
41007	007	10000100	00010001
41010	008	10000011	00010000
41011	009	01000000	01001110
41012	010	10010100	00001110
41013	011	00000100	00110000
41014	012	00111000	00011011
41015	013	11110100	00101010
41016	014	00001100	00101111
41017	015	00001100	00101110
41020	016	00000100	00110000
41021	017	01000011	11010100
41022	018	01000011	01101110
41023	019	01000001	00001111
41024	020	10101011	00000000
41025	021	11010101	00000000
41026	022	00001100	00000100
41027	023	00000100	00110000
41030	024	01010000	01100011
41031	025	00110000	00110010
41032	026	00000001	11000100
41033	027	00110000	00101000
41034	028	11111011	00000001
41035	029	00110001	01110110
41036	030	00100010	00000000
41037	031	00101010	00000010
41040	032	10001100	00001101
41041	033	00000011	00000000
41042	034	10101011	00000000
41043	035	01001010	00000010
41044	036	11111011	00000000
41045	037	00100010	00000001
41046	038	10001110	00000000
41047	039	00100010	00000000
41050	040	10001100	00101011
41051	041	10001100	00000000
41052	042	00110010	00000011
41053	043	10110110	00000000
41054	044	11010010	10000000
41055	045	00100010	00000000
41056	046	10000010	00001011
41057	047	10000010	11000000
41060	048	00110000	00011001
41061	049	11000111	00000000
41062	050	00101000	10000001
41063	051	10101010	01001011
41064	052	00000011	00000000
41065	053	00011000	01111110
41066	054	00000011	00000000
41067	055	01010000	10000001
41070	056	00000011	00000000
41071	057	01100000	10111111

PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION
COPYRIGHT DGC. 1979
0076 LP201

41072	058	11010100	00000000
41073	059	00100000	10000000
41074	060	10000011	00000101
41075	061	11011110	00000000
41076	062	01010000	10000000
41077	063	01010000	00110011
41100	064	00110000	01000010
41101	065	11011110	00000000
41102	066	00100000	01011000
41103	067	11010101	01010000
41104	068	11111011	00100000
41105	069	01011000	01000010
41106	070	01011000	01110110
41107	071	01100000	01111111
41110	072	00000001	11000010
41111	073	01000000	01011110
41112	074	01000000	11010001
41113	075	10000010	00000100
41114	076	00000001	10111100
41115	077	11010101	00000000
41116	078	00100000	01001010
41117	079	00111000	00101010
41120	080	10011100	00100010
41121	081	00000001	10110110
41122	082	01010000	01001100
41123	083	00101001	00101100
41124	084	00111000	00011011
41125	085	10011101	00000101
41126	086	01001000	00110001
41127	087	00000100	00110000
41130	088	01011000	00110110
41131	089	10000101	00000000
41132	090	00110000	00101000
41133	091	01110110	01000001
41134	092	10010100	00000000
41135	093	01010000	01000101
41136	094	00110011	00000001
41137	095	00111011	00000000
41140	096	10111110	00000000
41141	097	10110101	00000000
41142	098	01010000	01000011
41143	099	10010000	00000000
41144	100	00101011	00000000
41145	101	10101010	10010000
41146	102	11010011	00000100
41147	103	00000001	11111110
41150	104	00100000	01000101
41151	105	10101010	10010101
41152	106	00000001	00000100
41153	107	10000101	00000000
41154	108	00000001	00001001
41155	109	11010011	00000000
41156	110	00011000	01000011
41157	111	11111011	00000001
41160	112	00000001	00001010
41161	113	00101011	00000000
41162	114	10101010	00000101

```
41163 115 00000001 11111010
41164 116 00000001 00000010
41165 117 10000011 00000000
41166 118 10101010 10010011
41167 119 00000001 11111110
41170 120 00101000 00101000
41171 121 01110110 11000001
41172 122 00111000 00110110
41173 123 00000011 00000010
41174 124 10110010 01000010
41175 125 00000001 01001011
41176 126 00111000 01010100
41177 127 00010000 01010110
41200 128 00100000 00011010
41201 129 10001100 00011111
41202 130 00000001 01011011
41203 131 00100000 00110100
41204 132 10011110 00000000
41205 133 01011000 01010100
41206 134 10001101 00000000
41207 135 01001000 01000011
41210 136 00100000 00101010
41211 137 00001101 00000011
41212 138 00101000 01000011
41213 139 00000001 11110011
41214 140 01000011 00010100
41215 141 00100100 00001101
41216 142 00111000 00011010
41217 143 11100111 00000000
41220 144 00111000 00110110
41221 145 01011000 00110111
41222 146 00001101 00000101
41223 147 00000000 00010101
41224 148 00111000 00110111
41225 149 01011000 00110110
41226 150 00000100 00101100
41227 151 01000011 00010010
41230 152 01000011 01101101
41231 153 01100101 00000001
41232 154 00100100 00001010
41233 155 10001010 00000000
41234 156 11010101 00000000
41235 157 01010000 01101111
41236 158 00110000 00011001
41237 159 11011011 00000000
41240 160 10011111 00000101
41241 161 00100000 00011001
41242 162 11000111 00000000
41243 163 00111000 01011010
41244 164 11111010 00001100
41245 165 00001011 00000000
41246 166 11011010 10010000
41247 167 00110000 01101001
41250 168 11010010 10011100
41251 169 00000101 11101111
41252 170 11100111 00000000
41253 171 10111111 00000000
```



```
41254 172 00110000 00101001
41255 173 10010101 00001101
41256 174 00000001 01100000
41257 175 00110000 01100010
41260 176 11010010 00000100
41261 177 00000001 00101111
41262 178 00101000 00010101
41263 179 10001101 10100101
41264 180 00000001 01010111
41265 181 00101000 00011100
41266 182 00110000 00011110
41267 183 10010101 10101100
41270 184 00110000 00011111
41271 185 10001101 00000101
41272 186 11000010 00000000
41273 187 10010101 10101101
41274 188 00000001 00100110
41275 189 10101000 00001100
41276 190 00000001 00001000
41277 191 00101000 01010100
41300 192 00001001 10011000
41301 193 00000000 10001001
41302 194 00000000 00001010
41303 195 10101010 00000101
41304 196 00000100 00101100
41305 197 00100000 00101010
41306 198 00110000 01011101
41307 199 11010010 00000100
41310 200 00000001 00111111
41311 201 00110000 00011010
41312 202 10010101 00001101
41313 203 00000100 00101100
41314 204 00110000 00101010
41315 205 10010100 00101011
41316 206 00000001 00110011
41317 207 10010101 00001100
41320 208 00000001 00110110
41321 209 00111000 00110010
41322 210 00110000 01010011
41323 211 11111011 00001100
41324 212 10010101 00001101
41325 213 00000001 10100111
41326 214 10101010 01001010
41327 215 00101000 00110100
41330 216 00100000 01010100
41331 217 10100110 00000000
41332 218 01000000 01010100
41333 219 00001001 01000100
41334 220 00000001 00110101
41335 221 10100110 00000000
41336 222 10111110 00000000
41337 223 01011000 01010100
41340 224 00001001 00110100
41341 225 00000001 00110000
41342 226 01001000 01000011
41343 227 00001001 00110001
41344 228 00010000 00110010
```

```
41345 229 00000001 00000010
41346 230 00000001 00000111
41347 231 00110000 01101110
41350 232 00100000 01010110
41351 233 00001001 00110110
41352 234 00110000 01101101
41353 235 00100000 01010100
41354 236 00001001 00110011
41355 237 00100000 01010100
41356 238 00101000 01000011
41357 239 00111000 00110100
41360 240 10101010 00000101
41361 241 10000010 00000101
41362 242 10000101 00000001
41363 243 11100101 00000000
41364 244 01000000 01010100
41365 245 00001001 00011111
41366 246 01010000 01010011
41367 247 10000101 00000000
41370 248 01000000 01101011
41371 249 01000000 01010110
41372 250 00001001 00011010
41373 251 01010000 01101100
41374 252 00001001 00011000
41375 253 01010000 01101101
41376 254 00001001 00010110
41377 255 01010000 01101110
41400 256 00000001 00010001
41401 257 00110001 00000111
41402 258 00111000 00011011
41403 259 10011101 00000101
41404 260 01010000 00110001
41405 261 00000100 00101100
41406 262 01010000 01010011
41407 263 00111000 01010100
41410 264 00010000 01010110
41411 265 00101000 00110100
41412 266 00000001 11010100
41413 267 10101011 01010000
41414 268 01000000 01100000
41415 269 00000001 00110011
41416 270 00101100 00001011
41417 271 10101110 01000010
41420 272 01000000 01101001
41421 273 00000100 00101100
41422 274 00110011 00000000
41423 275 11111011 00000001
41424 276 00110000 00101000
41425 277 01011000 00110110
41426 278 00011010 00000010
41427 279 00000001 00000001
41430 280 00101010 00000001
41431 281 00111010 00000000
41432 282 10111101 00000100
41433 283 10111011 00000000
41434 284 01011010 00000001
41435 285 00110010 00000011
```



```
41436 286 11110110 00000001
41437 287 01011000 00110110
41440 288 00111000 00011001
41441 289 11010010 10000010
41442 290 11100111 00000001
41443 291 11100111 11000001
41444 292 11111000 00000000
41445 293 00101010 00000000
41446 294 11101111 00000000
41447 295 10001110 00000000
41450 296 01001010 00000000
41451 297 11010010 01000000
41452 298 00000100 00110110
41453 299 00000000 01011001
41454 300 00000000 01000101
41455 301 01011000 00110110
41456 302 00111000 01010100
41457 303 11111010 00000100
41460 304 00000101 00111100
41461 305 00111000 00101010
41462 306 01011000 01010011
41463 307 00000100 00110110
41464 308 10000101 00000000
41465 309 00010000 01000101
41466 310 00000001 01110110
41467 311 01000000 01101001
41470 312 00000101 00110100
41471 313 01000000 01101001
41472 314 00001001 11110011
41473 315 01000000 01101001
41474 316 01001000 01000101
41475 317 00100000 00101001
41476 318 00001001 11010110
41477 319 00101000 01000101
41500 320 00100000 01101011
41501 321 10001111 00001101
41502 322 10100110 00000000
41503 323 01000000 01101011
41504 324 00111000 00110010
41505 325 00110000 01101100
41506 326 11111011 00000100
41507 327 00001001 11011000
41510 328 00100000 01100000
41511 329 00000001 10010111
41512 330 10101011 00000100
41513 331 00000001 00001110
41514 332 11001011 00100000
41515 333 10101011 00001110
41516 334 10001010 00000101
41517 335 01001000 01101001
41520 336 00110000 01100000
41521 337 00111001 11011010
41522 338 11110100 00001100
41523 339 00111001 11011001
41524 340 11110100 00000101
41525 341 00001001 11011000
41526 342 11010011 00001100
```

```
41527 343 00000001 10001001
41530 344 00000001 01110111
41531 345 11010000 10010100
41532 346 00000001 01101011
41533 347 00110000 01110010
41534 348 01000000 01110010
41535 349 00010000 01101010
41536 350 00000100 00110000
41537 351 11010010 11000000
41540 352 10010110 00000000
41541 353 00111000 01100001
41542 354 00100001 00110100
41543 355 11100100 00000101
41544 356 00000001 01000111
41545 357 00111000 01011000
41546 358 11111010 00000100
41547 359 00000001 11111110
41550 360 00111000 00111011
41551 361 11111010 00000100
41552 362 00000001 11111110
41553 363 00000010 00000000
41554 364 01000011 00010001
41555 365 10101100 00010001
41556 366 10101101 00100000
41557 367 11010010 01001010
41560 368 00000001 11011010
41561 369 01001000 01000101
41562 370 10101011 00010101
41563 371 01000000 01100000
41564 372 11111100 00000011
41565 373 01000000 01100001
41566 374 11111011 10010000
41567 375 00110001 00011001
41570 376 11110110 00000011
41571 377 00101010 11110000
41572 378 10101010 11000000
41573 379 11111010 01000000
41574 380 00110000 00011010
41575 381 11000111 00000000
41576 382 10110111 00000101
41577 383 00000001 10110101
41600 384 11000101 10101100
41601 385 00000001 11110101
41602 386 00101001 00001110
41603 387 10111110 00000000
41604 388 00101011 11110110
41605 389 00010000 01000101
41606 390 00101011 00000000
41607 391 10010101 00000100
41610 392 10101010 11000000
41611 393 11010000 00000000
41612 394 00100000 00011001
41613 395 10100111 00000000
41614 396 10011110 00000000
41615 397 10000101 00000000
41616 398 10101101 01010000
41617 399 00000011 00000000
```



```
41620 400 01000011 10100001
41621 401 00110001 00110101
41622 402 00111100 00111110
41623 403 01000101 01001110
41624 404 01011001 01100001
41625 405 01100100 01100011
41626 406 00000000 01001111
41627 407 00101011 00101011
41630 408 00001101 00001101
41631 409 00001011 00001010
41632 410 00001110 00001110
41633 411 00001100 00010000
41634 412 01101011 01101010
41635 413 00001001 01101100
41636 414 00000111 00000111
41637 415 00001010 00001010
41640 416 00100111 00000101
41641 417 01100001 01100001
41642 418 01100101 01100101
41643 419 01011001 01011001
41644 420 01000100 01000100
41645 421 00011001 01011100
41646 422 00000101 01011000
41647 423 01010111 01011010
41650 424 01010111 01010111
41651 425 01001011 01001011
41652 426 01010111 01001100
41653 427 01010000 01011111
41654 428 00000001 01010100
41655 429 10101010 01010000
41656 430 01001000 00110100
41657 431 00000001 10001100
41660 432 10000100 01010001
41661 433 10000101 10010000
41662 434 00000001 10000111
41663 435 01010000 01100010
41664 436 00000001 11111110
41665 437 10101101 10010000
41666 438 01001000 01101001
41667 439 00111001 00011011
41670 440 00101000 00011101
41671 441 10001100 00000101
41672 442 00000101 10110010
41673 443 01000011 00000000
41674 444 11111011 00000000
41675 445 00000001 11111100
41676 446 00111001 00001101
41677 447 00110000 00011011
41700 448 01000011 00000000
41701 449 11111011 00000000
41702 450 10010100 00100100
41703 451 00000001 11111101
41704 452 10000101 10010001
41705 453 10001010 00000101
41706 454 00000001 00111010
41707 455 10101011 00000000
41710 456 00100000 01010101
```

0083 LP201

```
41711 457 00001101 00001010
41712 458 00000100 00110000
41713 459 00000000 10000010
41714 460 01000000 01101001
41715 461 00101000 01010100
41716 462 10101011 00000000
41717 463 00100000 00000111
41720 464 00001001 01100111
41721 465 00000101 10011011
41722 466 00000000 10001001
41723 467 01000100 00110111
41724 468 00101000 01010010
41725 469 10000101 00110000
41726 470 10101011 00000100
41727 471 00000001 00101001
41730 472 00111000 00011011
41731 473 01100000 10111111
41732 474 00110000 01011100
41733 475 11110111 00000010
41734 476 11110100 00000000
41735 477 00111000 00011010
41736 478 11011111 00000000
41737 479 01011000 01011100
41740 480 00110000 00100011
41741 481 11110110 00000000
41742 482 01000010 00000000
41743 483 00111000 00100110
41744 484 10111110 00000000
41745 485 01000011 00000000
41746 486 01100000 01111111
41747 487 00000001 00011001
41750 488 00101000 01010001
41751 489 10101011 00000100
41752 490 00000001 00010110
41753 491 00111000 01001111
41754 492 11111010 10000000
41755 493 11010010 10000000
41756 494 11111010 01000000
41757 495 01011000 01001111
41760 496 00111000 00011111
41761 497 10101011 01100000
41762 498 11010010 10000000
41763 499 00000001 11100110
41764 500 01010000 01100100
41765 501 00000001 00001011
41766 502 11010101 00000000
41767 503 11111101 01100000
41770 504 01011000 00110100
41771 505 10101100 00000000
41772 506 00000101 00000001
41773 507 01000000 00011001
41774 508 01010000 01110001
41775 509 00000001 00000011
41776 510 10000100 01010001
41777 511 01010000 01100110
```

PROPRIETARY INFORMATION OF DATA GENERAL CORPORATION
COPYRIGHT DGC. 1979
0084 LP201
THE LAST 512 LOCATIONS ARE CONTAINED IN THE PROMS WITH DG NO.-

```
          100-2132 100-2129
42000 000 01000000 01101010
42001 001 00000100 00110000
42002 002 00101000 01000001
42003 003 00100000 00000111
42004 004 00001001 00110011
42005 005 00000100 00110000
42006 006 00000000 10001001
42007 007 01000000 01101010
42010 008 00101000 00111100
42011 009 00111000 00111011
42012 010 11101110 00000000
42013 011 01010000 01000101
42014 012 00110000 00111101
42015 013 01110110 01000001
42016 014 00110000 01000101
42017 015 00000001 10111000
42020 016 10000100 01010000
42021 017 01010000 01011101
42022 018 00000001 10011101
42023 019 01000000 01101001
42024 020 00001001 00100000
42025 021 10000010 11000000
42026 022 01000000 00111111
42027 023 00001001 00011101
42030 024 00111000 00111111
42031 025 11100110 00000000
42032 026 01000000 00111111
42033 027 00001001 00011001
42034 028 01000000 00111110
42035 029 00001001 00010111
42036 030 00111000 00111110
42037 031 11111010 11000000
42040 032 10011110 00000000
42041 033 01011000 00111110
42042 034 11111101 00000000
42043 035 01011000 01000000
42044 036 00001001 00010000
42045 037 00101000 01000000
42046 038 10001110 00000000
42047 039 01001000 01000000
42050 040 00110000 00111110
42051 041 00001101 00001101
42052 042 00010000 00111110
42053 043 00000001 00000001
42054 044 00011000 00111111
42055 045 00000001 11110111
42056 046 00001001 00000110
42057 047 00111000 00011001
42060 048 00110000 01000000
42061 049 11000110 00000000
42062 050 10011111 00000100
42063 051 00000100 00000011
42064 052 01011000 01011010
42065 053 00000001 10011100
42066 054 01000011 00011111
42067 055 10100101 00101010
42070 056 00000011 00000000
42071 057 11010000 00000000
42072 058 01010000 01110010
```

```
42073 059 10000101 00000000
42074 060 00110000 00101000
42075 061 01110110 01000001
42076 062 01011000 00110110
42077 063 00111011 00000001
42100 064 10111110 00000000
42101 065 10101101 00000000
42102 066 11010100 01010001
42103 067 11010010 01100000
42104 068 10100100 00100011
42105 069 00000001 11111110
42106 070 00100011 00000000
42107 071 11000111 00000000
42110 072 00010000 01110010
42111 073 11000100 00000000
42112 074 01000011 00000000
42113 075 00000100 00110110
42114 076 00101000 01011000
42115 077 10101010 00000101
42116 078 00000001 01100001
42117 079 00110000 00000101
42120 080 11001111 00100101
42121 081 11111100 01010000
42122 082 00100000 01011100
42123 083 10010111 00001100
42124 084 00000001 01010100
42125 085 11000110 00000000
42126 086 00110000 01001111
42127 087 00101100 00001001
42130 088 10101010 01000000
42131 089 00101000 00011100
42132 090 11010010 10001010
42133 091 00101000 00011111
42134 092 00110000 01000001
42135 093 11110100 00000010
42136 094 11101100 00100001
42137 095 11111001 00000000
42140 096 11001101 00111110
42141 097 10110010 00000000
42142 098 11010010 01001011
42143 099 01010000 01000001
42144 100 11010101 00000000
42145 101 01010000 01110111
42146 102 01010000 01001001
42147 103 00101000 01000010
42150 104 11001100 00100011
42151 105 01001000 01000010
42152 106 10101011 10000100
42153 107 00000001 00111101
42154 108 01001000 01110110
42155 109 00000001 00001110
42156 110 00010000 01001001
42157 111 00101000 01011001
42160 112 10101010 00000101
42161 113 00000001 00001111
42162 114 00011000 01011001
42163 115 00000001 00110101
```



```
42164 116 01101010 00111111
42165 117 10000101 00000000
42166 118 01000000 01101111
42167 119 00001100 00101101
42170 120 00100000 00011110
42171 121 00111000 01011100
42172 122 11100111 00000000
42173 123 01000000 01011100
42174 124 00111000 00100011
42175 125 10011110 00000000
42176 126 01000011 00000000
42177 127 00000001 00101001
42200 128 00100000 01100011
42201 129 10011000 00000101
42202 130 00000001 01001110
42203 131 00111000 01001011
42204 132 11111011 00001101
42205 133 00111000 00000110
42206 134 00110000 00011111
42207 135 00100000 01001100
42210 136 11000101 00101011
42211 137 00110000 01001001
42212 138 11011101 00100010
42213 139 00010000 01001110
42214 140 10100100 00000010
42215 141 00000001 00011011
42216 142 01000000 01001100
42217 143 00001001 00101001
42220 144 10000010 10000010
42221 145 10100010 01000000
42222 146 11100010 00000010
42223 147 00001001 00101100
42224 148 10000000 00000000
42225 149 10011111 00000000
42226 150 10011100 00000000
42227 151 11100010 10000000
42230 152 10101000 01000010
42231 153 11010010 10000000
42232 154 00101000 01100111
42233 155 10101010 00110110
42234 156 10011010 01100000
42235 157 00100000 01001100
42236 158 00110001 00110001
42237 159 11011111 00000000
42240 160 00110000 00100100
42241 161 11110110 00000000
42242 162 01000010 00000000
42243 163 00111000 00011101
42244 164 00101000 01001001
42245 165 11101101 00000100
42246 166 10000010 00000101
42247 167 00000001 11010001
42250 168 11010101 00000000
42251 169 01100000 10111111
42252 170 01100010 10000001
42253 171 01100000 00000001
42254 172 11010011 00000100
```

```
42255 173 01100000 01111111
42256 174 01100101 10000001
42257 175 00110000 01000001
42260 176 11010000 00000000
42261 177 00100000 01100100
42262 178 10000010 00000100
42263 179 00000001 11000101
42264 180 00100000 01110100
42265 181 10000010 00000000
42266 182 01010000 01010111
42267 183 00000001 11000001
42270 184 00110000 01001111
42271 185 11010010 01000010
42272 186 10000010 10001010
42273 187 00101000 01001011
42274 188 00110000 01001101
42275 189 11001110 00000000
42276 190 01001000 01001101
42277 191 01011000 00110111
42300 192 00101000 01001010
42301 193 10101110 01010000
42302 194 10101010 01010000
42303 195 10110110 00000000
42304 196 00101000 01011110
42305 197 10111001 00010101
42306 198 00101000 00100111
42307 199 10110110 00000010
42310 200 01000010 00000000
42311 201 00111100 00001000
42312 202 10101010 00000011
42313 203 00111010 00000000
42314 204 00110000 01001101
42315 205 00101000 01001111
42316 206 00000100 00110111
42317 207 00000001 11111111
42320 208 01011000 01001100
42321 209 00111000 01001010
42322 210 00000001 11001100
42323 211 01100000 10111111
42324 212 01100101 00000001
42325 213 01000000 00111011
42326 214 01000000 00111000
42327 215 11111101 00000001
42330 216 00011000 00111011
42331 217 00000001 00000010
42332 218 00000001 00010000
42333 219 01011000 00111001
42334 220 00100000 00111010
42335 221 00101000 00101011
42336 222 00111000 00101000
42337 223 10000010 01010000
42340 224 10001100 00101011
42341 225 11100110 00000000
42342 226 10100111 00000000
42343 227 01000000 00111010
42344 228 00010000 00111100
42345 229 00000001 00000001
```



```
42346 230 00100000 01011000
42347 231 00101100 00001110
42350 232 00001100 00101101
42351 233 00000001 10111111
42352 234 00101000 00111000
42353 235 11101100 10100100
42354 236 00001100 00000011
42355 237 00111001 11100010
42356 238 01011000 00111001
42357 239 00000001 10111001
42360 240 00100000 00111001
42361 241 10000010 10010100
42362 242 00000001 10110110
42363 243 00100000 00111011
42364 244 11100100 00100000
42365 245 00101000 00111000
42366 246 11101100 00010110
42367 247 01001000 00111000
42370 248 00110100 00001011
42371 249 11010010 01000011
42372 250 00001101 00000010
42373 251 00000001 10101101
42374 252 01000000 11011110
42375 253 01011000 00110111
42376 254 00111000 00000000
42377 255 01100101 00000001
42400 256 00100000 00110111
42401 257 01000011 11111111
42402 258 00100100 00001001
42403 259 10000000 00000000
42404 260 00110000 00011010
42405 261 11000111 00000000
42406 262 00110001 00001011
42407 263 10101101 01010001
42410 264 10101010 01010000
42411 265 11010011 00000000
42412 266 10000010 10000011
42413 267 00000001 11111101
42414 268 00111000 00100110
42415 269 10111110 00000000
42416 270 01000011 00000000
42417 271 11111101 00000000
42420 272 00000110 00000000
42421 273 01000101 00010001
42422 274 01000100 01001100
42423 275 01000100 01101110
42424 276 01000100 11011000
42425 277 01000010 10001101
42426 278 01000100 11110000
42427 279 01000101 10111111
42430 280 00100000 00011011
42431 281 10011110 00000000
42432 282 01100101 00000001
42433 283 00100100 00001111
42434 284 10000010 10001010
42435 285 00101000 00101011
42436 286 01001000 01110011
```

```
42437 287 00101000 00111101
42440 288 10000010 01000010
42441 289 01001000 00111100
42442 290 01010000 01010001
42443 291 01010000 01010010
42444 292 10000110 01010010
42445 293 00011000 01010001
42446 294 10000110 01001010
42447 295 00011000 01010010
42450 296 00110000 00000110
42451 297 10001010 11000000
42452 298 10000010 10000000
42453 299 11001111 10011100
42454 300 11010011 00000001
42455 301 00110000 00011100
42456 302 01010000 00111101
42457 303 10100111 01000000
42460 304 10101101 01110000
42461 305 01001000 01001111
42462 306 10101010 01010000
42463 307 00110000 00011100
42464 308 10000110 01010010
42465 309 11001110 00000000
42466 310 01100000 10111111
42467 311 00100000 01011100
42470 312 00110000 00000110
42471 313 11000111 00000000
42472 314 10001110 00000000
42473 315 01001000 01011100
42474 316 01100000 01111111
42475 317 00100100 00001011
42476 318 00101000 00010101
42477 319 10001111 00000000
42500 320 00110001 00010000
42501 321 11000111 10010000
42502 322 10010010 10010000
42503 323 11010010 10010000
42504 324 11000110 00000000
42505 325 10001110 00000000
42506 326 01001000 01010101
42507 327 10000101 00000000
42510 328 00110000 00111101
42511 329 01110110 11000001
42512 330 00100001 00000101
42513 331 10001101 00001101
42514 332 10101101 00000000
42515 333 01001000 00010100
42516 334 00000100 00101100
42517 335 00000101 00101000
42520 336 00000000 11110000
42521 337 01011000 01111010
42522 338 01000000 01111001
42523 339 10000010 01000000
42524 340 01000000 01111011
42525 341 00010000 01110111
42526 342 00100000 01110111
42527 343 00111000 00101011
```



```
42530 344 11100101 00100010
42531 345 00000001 00000110
42532 346 10000010 00000100
42533 347 00000001 00001010
42534 348 00111000 01011000
42535 349 01011000 01111100
42536 350 00001001 00100011
42537 351 00100000 01111011
42540 352 10000010 10000000
42541 353 00100000 01111001
42542 354 00111000 01111010
42543 355 01100000 01111111
42544 356 00000100 00000000
42545 357 11100101 00000100
42546 358 00000001 11111001
42547 359 01000000 01110111
42550 360 00111000 00000101
42551 361 00100000 01111000
42552 362 10011101 00100010
42553 363 00000100 00000011
42554 364 00010000 01111000
42555 365 00100000 01111100
42556 366 00000001 11110000
42557 367 11111011 00000000
42560 368 10000101 00000001
42561 369 10000101 01010000
42562 370 01100101 00000001
42563 371 01000000 01110111
42564 372 01110010 00111111
42565 373 00111000 01100100
42566 374 11111011 10010010
42567 375 00111000 01001111
42570 376 11110010 01000000
42571 377 00110000 01000010
42572 378 11010010 01110101
42573 379 10000101 00000000
42574 380 10110010 01000000
42575 381 10010010 01000000
42576 382 11010010 01100000
42577 383 10011111 10000000
42600 384 11000010 01000001
42601 385 01100101 00000001
42602 386 01100000 10111111
42603 387 00110000 01011000
42604 388 01000000 01011000
42605 389 00111000 00111010
42606 390 11100110 00000000
42607 391 00111000 00000110
42610 392 11101011 10010000
42611 393 11110111 00000000
42612 394 10011111 00000000
42613 395 11011110 10000000
42614 396 10111111 10000101
42615 397 10101101 00000000
42616 398 01100111 00111111
42617 399 11010100 00000000
42620 400 00111000 00100101
```

```
42621 401 10011110 00000000
42622 402 01000011 00000000
42623 403 00111000 00100110
42624 404 10111110 00000000
42625 405 01000011 00000000
42626 406 00000101 00000001
42627 407 01000100 10101000
42630 408 00101000 00110001
42631 409 10101010 10000000
42632 410 01100000 10111111
42633 411 00101000 01011100
42634 412 10101010 10000000
42635 413 10101010 01110010
42636 414 01001000 01011100
42637 415 01100000 01111111
42640 416 00110000 00100011
42641 417 10110110 00000000
42642 418 01000010 00000000
42643 419 00000011 00000001
42644 420 01100101 00000001
42645 421 00110000 00011011
42646 422 00100000 00010010
42647 423 11000100 00010011
42650 424 00000100 00101100
42651 425 00100000 00100000
42652 426 00110000 00011010
42653 427 10010101 00001101
42654 428 00100000 00101010
42655 429 01000000 00100000
42656 430 00010000 00100000
42657 431 00011000 00100001
42660 432 00000001 00001011
42661 433 00100000 00000111
42662 434 10000011 00000000
42663 435 01000000 00100001
42664 436 00100000 00001010
42665 437 10000011 00000000
42666 438 10010101 00001101
42667 439 00100000 00101010
42670 440 01000000 00100000
42671 441 01000000 00001010
42672 442 00100000 00011101
42673 443 00101000 00011001
42674 444 10100100 00000000
42675 445 00000101 00000001
42676 446 01000010 10011011
42677 447 00101100 00001100
42700 448 10101110 01001010
42701 449 00000100 00101100
42702 450 10000101 10010000
42703 451 01000000 01111101
42704 452 00100000 00101010
42705 453 01000000 00100000
42706 454 01000000 00001010
42707 455 00100000 00000111
42710 456 01000000 00100001
42711 457 00000100 00110000
```



```
42712 458 01000100 11111101
42713 459 01000101 01010001
42714 460 01000000 11111101
42715 461 01000000 00100011
42716 462 00000000 00000100
42717 463 00000000 00000101
42720 464 00000000 10000100
42721 465 00111111 11111000
42722 466 00111111 11111001
42723 467 00111111 11111010
42724 468 00111111 11111011
42725 469 00111111 11111100
42726 470 00111111 11111101
42727 471 00111111 11111110
42730 472 00111111 11111111
42731 473 00000101 11111111
42732 474 00000000 00000000
42733 475 00000110 00000000
42734 476 00000010 00010000
42735 477 00001111 11110111
42736 478 00000000 00001111
42737 479 00000000 00000000
42740 480 00000000 00010000
42741 481 00000010 00000000
42742 482 00000000 11111111
42743 483 00000000 01111111
42744 484 00000000 00000111
42745 485 00000000 00001000
42746 486 00000000 00001010
42747 487 00000000 00001011
42750 488 00000000 00001101
42751 489 01000000 00000000
42752 490 01001000 00000000
42753 491 01010000 00000000
42754 492 01011000 00000000
42755 493 01100000 00000000
42756 494 01101000 00000000
42757 495 01110000 00000000
42760 496 01111000 00000000
42761 497 00000000 00010000
42762 498 00000000 00011011
42763 499 00000000 00100000
42764 500 00000000 00110000
42765 501 01000100 10101000
42766 502 01000101 10000001
42767 503 01000101 01110001
42770 504 01000101 01101111
42771 505 01000001 00111000
42772 506 00010000 00000000
42773 507 11111111 11111111
42774 508 11111111 11111111
42775 509 00000000 00000001
42776 510 00000000 00000010
42777 511 01000000 00000000
```